Products finishing

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JUNE 1948

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Products finishing

The A.E.S. Has Come a Long Way

The occasion of the 35th Annual Convention of the American Electroplaters' Society, to be held this month in Atlantic City, New Jersey, provides an opportunity to review the progress made by that organization and to assess briefly the value of its contribution to the advancement of the electroplating and finishing industry.

In 1909 Mr. Charles H. Proctor, realizing the need for an educational society of electroplaters, founded the National Electroplaters' Association dedicated to the "dissemination of the knowledge of electroplating." In 1912 the National Electroplaters' Association was reorganized into the American Electroplaters' Society with the aim: "the advancement of education in the art and science of electroplating."

What an oak has grown from the acorn! Beginning as a medium for the exchange of ideas, shop experiences, theories, and hopes of working platers, the Society has grown to become the center of a large part of the activity of the electroplating industry. The Society broke down the barriers and bridged the gap between scientists and practical men, causing the practical platers to become more scientific and the scientists to become more practical. As the Society expanded to include manufacturers' and suppliers' representatives, these men became members of the team and were thus able to add their contributions to the advancement of the industry.

One of the early aims of the A.E.S. was the establishment of a research project at the U. S. Bureau of Standards. More recently, other research projects were established at various universities until a total of ten projects are currently engaged in the investigation of various problems connected with the electroplating industry. The emphasis placed on research by the Society stimulated research by suppliers and manufacturers. In addition to the investigations conducted in company laboratories and plants, some suppliers have established research fellowships at universities, taking advantage of the specialized facilities available.

Each month at meetings of the Branches of the A.E.S. in the United States, Canada, and Australia, platers and technical men discuss new techniques and new developments, and exchange information. At the annual A. E. S. Convention, the highlights of the past year's progress are presented in the form of scientific papers and discussions.

Convention Headquarters —Hotel Ambassador

A. E. S.

35th ANNUAL CONVENTION

ATLANTIC CITY, JUNE 28-JULY 1

The Newark Branch has completed plans for sponsoring the 35th Annual Convention of the American Electroplaters' Society to be held in Atlantic City, New Jersey, from June 28 to July 1, inclusive, and extends a most cordial invitation to members of the A.E.S. and all others interested in finishing problems. The Newark Branch members and particularly the Convention Committee, under the dynamic leadership of Horace H. Smith, have directed all their efforts to the end that attendance at the Convention and Exposition will be a profitable and unforgettable experience.

Two previous annual conventions of the A.E.S. have been sponsored by the Newark Branch, in 1926 at Newark, N. J., and in 1939 at Asbury Park, N. J.

The Society, with headquarters in the Ambassador Hotel, has scheduled technical sessions at which recognized experts will present papers on various

NATIONAL OFFICERS

AMERICAN ELECTROPLATERS' SOCIETY

(Right) Kenneth M. Huston, President.

(Below—Left to Right) S. S. Johnston, First Vice-President; Arthur W. Logozzo, Second Vice-President; William J. Neill, Third Vice-President; A. K. Graham, Executive Secretary.

phases of electroplating and other surface finishes of great interest to executives and technical personnel of all manufacturing plants concerned in any way with metal finishing. Technical sessions will be held in the Atlantic City Convention Hall. Exhibits of plated articles from various A.E.S. branches featuring commercial and special finishes also will be presented in the Convention Hall. The Platedware Exhibit will contain outstanding examples of the plater's art and skill.

Atlantic City facilities lend themselves particularly well to the social phase of the Convention. An entertainment program for the members and their wives has been planned and is fully outlined in the official program. Two annual events, the International Fellowship Club Luncheon and the Aunt Ella's Society Luncheon Party, have been scheduled. The International Fellowship Club Golf Tournament, to be held at the Atlantic City Country Club, will afford an opportunity for "sea-level golfing." As a climax to all preceding activities, the concluding social event will be the main banquet.

The Convention Committee has made every effort to ensure that time spent at the Convention will be made enjoyable by social activities and valuable from the standpoint of technical information gained. The committee wishes to take this opportunity to express its sincere thanks and appreciation for the cooperation of the many firms who have so generously helped in making this Convention possible.

Official Program

SUNDAY, JUNE 27

3:00 P.M.—Registration, Upper Lounge, Hotel Ambassador.

Registration Fee, $10.00. This entitles registrant to a book of tickets that can be used for all functions and activities during the Convention. Registrants need not be members of the American Electroplaters' Society.

MONDAY, JUNE 28

8:00 A.M.—Registration, Upper Lounge, Hotel Ambassador.

9.30 A.M.—Opening Session, Atlantic City Convention Hall Ballroom on the Boardwalk.

Invocation—REV. FRANK C. MESLE. Welcome to Delegates, Members and Guests—HORACE H. SMITH, Convention General Chairman. Welcome to Atlantic City—Mayor of Atlantic City. Greetings from Newark Branch—ZACHARY IRENAS, Newark Branch President. First Business Session—KENNETH M. HUSTON, Supreme President, Presiding.

12:30 P.M.—Luncheon, International Fellowship Club, Hotel Ambassador.

This luncheon is exclusively for suppliers and their representatives. Following the luncheon will be an election of officers for the coming year and a discussion of the arrangements for the Open House.

2:00 P.M.—First Educational Session, Second Floor Ballroom, Atlantic City Convention Hall.

8:30 P.M.—Open House, Renaissance Ballroom, Hotel Ambassador.

Dancing, Buffet Lunch, Refreshments, Presentation of Special Awards. All registrants are cordially invited to attend. A ticket for this event is included in your registration booklet. The Open House is held on the first night of the Convention to provide an opportunity for all registrants to become acquainted. It is sponsored by the International Fellowship Club, an organization formed to create goodwill in the metal-finishing industry. Membership in the club consists of manufacturers, supply houses, and their representatives serving the metal-finishing industry, and it is through their generosity that the Open House is made possible. A program, including a list of contributors, will be distributed.

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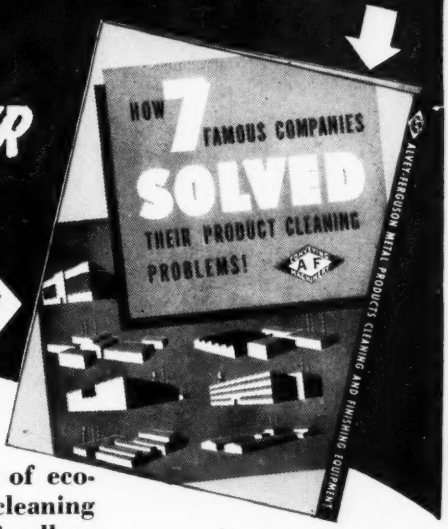

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TUESDAY, JUNE 29

8:00 A.M.—Registration, Upper Lounge, Hotel Ambassador.

8:00 A.M.—Breakfast, A.E.S. Branch Secretaries, Room 125, Hotel Ambassador.

9:30 A.M.—Second Educational Session, Second Floor Ballroom, Atlantic City Convention Hall.

12:00 Noon—Golf Tournament.

A golf tournament under the sponsorship of the International Fellowship Club will be held at the Atlantic City Country Club, Northfield, New Jersey, with Joseph J. Duffy serving as chairman. Transportation should be arranged through the Golf Committee. Attractive prizes will be awarded. An informal luncheon will be served at the Country Club between 12:00 noon and 1:30 P.M. A limited number of rental sets will be available at the club.

Afternoon and Evening—Open.

This is the time set aside for the members, wives, friends, and guests to take advantage of the entertainment facilities provided by Atlantic City and its Boardwalk and to leisurely visit the Industrial Finishing Exposition at Atlantic City Convention Hall. Here you will see large displays of equipment and supplies for electroplating, polishing, buffing, cleaning, degreasing, washing, rinsing, lacquering, and enameling. Many pieces of automatic equipment, as well as other types of equipment of recent design, will be shown at this exhibit, some of them in actual operation.

8:00 P.M.—Research Committee Meeting, Room 106, Ambassador Hotel.

WEDNESDAY, JUNE 30

8:00 A.M.—Registration, Upper Lounge, Hotel Ambassador.

9:30 A.M.—Third Educational Session, Second Floor Ballroom, Atlantic City Convention Hall.

12:00 Noon—Job Platers' Luncheon, Hotel Ambassador.

2:00 P. M.—Fourth Educational Session, Second Floor Ballroom, Atlantic City Convention Hall.

8:00 P. M.—Special Business Session, Atlantic City Convention Hall Ballroom.

Presiding, Kenneth M. Huston. Preliminary discussion of newly proposed constitution and proposed amendment by Newark Branch.

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- ★ FINEST FINISHES
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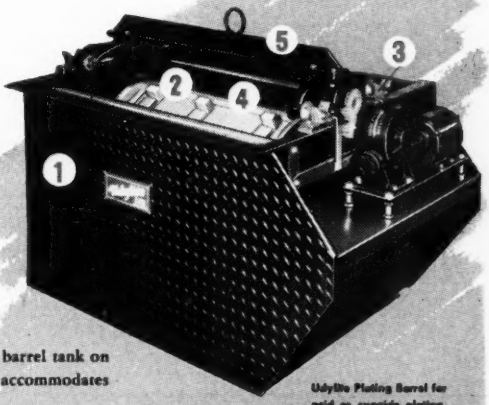

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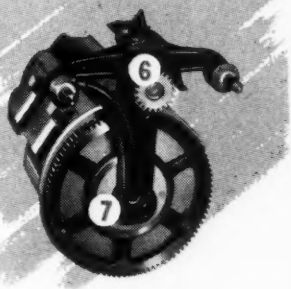

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Udylite Corporation, Detroit 11, Michigan

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THURSDAY, JULY 1

8:00 A.M.—Registration, Upper Lounge, Hotel Ambassador.

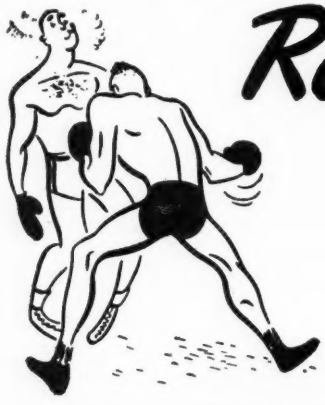
8:00 A.M.—Research Committee Breakfast, Room 125, Hotel Ambassador.

9:30 A.M.—Fifth Educational Session, Second Floor Ballroom, Atlantic City Convention Hall.

NOTE—This session is allocated exclusively to the Research Committee of the American Electroplaters' Society for reports on the research activities of the several research projects sponsored by the Society and conducted under the direction of leading metal finishing specialists.

2:00 P.M.—Final Business Session, Atlantic City Convention Hall Ballroom. Presiding, Kenneth M. Huston.

7:00 P.M.—Annual Banquet, Renaissance Ballroom, Hotel Ambassador. Dinner, Community Singing, Awards, Entertainment, Continuous Music for Dancing.



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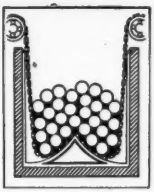

MONEL CHAINS in the Weldco mechanical pickler move up and down alternately, revolving stock and exposing all surfaces. At left, Monel "spreader" which helps revolve load, crack oxide scale and increase agitation. Sprockets, chain, and tank trim are also Monel. (Fabricated by Youngstown Welding & Engineering Company, Youngstown, Ohio.)

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But have you come across one with all the features of this *Weldco* job?

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Take the "spreader," a device that breaks up the load and makes it roll. This not only increases agitation, but also helps crack oxide scale. You get *faster* pickling . . . uniform action on *all* surfaces . . . reduce over-pickling . . . save steel.

The spreader — like all exposed parts of Youngstown's Weldco mechanical pickler — is made of Monel*. Experienced pickling room men know the *additional* savings that Monel makes possible.

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Ladies' Program

SUNDAY, JUNE 27

3:00 P.M.—Registration, Upper Lounge, Hotel Ambassador.
Registration Fee, $10.00. This entitles registrant to a book of tickets that can be used for all functions and activities during the Convention. Registrants need not be members of the American Electroplaters' Society.

MONDAY, JUNE 28

8:00 A.M.—Registration, Upper Lounge, Hotel Ambassador.

3:00 P.M.—Tea, Upper Lounge, Hotel Ambassador.

8:30 P.M.—International Fellowship Club Open House, Renaissance Ballroom, Hotel Ambassador.
Dancing, Buffet Lunch, Refreshments. All registrants are invited to attend.

TUESDAY, JUNE 29

8:00 A.M.—Registration, Upper Lounge, Hotel Ambassador.
The morning is open for your activities.

1:00 P.M.—Aunt Ella's Society Luncheon Party, Embassy Salon, Hotel Ambassador.
Sponsored by Oakite Products, Inc., under the direction of D. X. Clarin, this event includes an excellent meal and surprise entertainment.

Evening—Open.

WEDNESDAY, JUNE 30

8:00 A.M.—Registration, Upper Lounge, Hotel Ambassador.

1:00 P.M.—Luncheon with Music, Trellis Room, Ritz-Carlton Hotel (on the Boardwalk).
All ladies attending this luncheon will be presented with a keepsake.

8:00 P.M.—"Plato" Party, 22 Club Room, Hotel Ambassador.
This event is sponsored by the International Fellowship Club under the direction of Joan Trumbour Wiarda. Prizes.

THURSDAY, JULY 1

8:00 A.M.—Registration, Upper Lounge, Hotel Ambassador.
The morning and afternoon of the final day of the Convention have not been scheduled so that you may enjoy yourself as a carefree vacationist. If you have not already done so, we suggest that you visit the Steel Pier on the Boardwalk. You will find a ticket in your passbook which will be honored any day during the Convention, entitling you to all the facilities this interesting Pier has to offer.

7:00 P.M.—Annual Banquet, Renaissance Ballroom, Hotel Ambassador.
Dinner, Community Singing, Awards, Entertainment, Continuous Music for Dancing.

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METAL FINISHING EQUIPMENT • POLISHING AND PLATING MATERIALS

Educational Program

FIRST SESSION

Monday Afternoon, June 28, 2:00 P.M.

Second Floor Ballroom, Atlantic City Convention Hall

WILLIAM GEISSMAN, S. K. Williams Company, Presiding

1—"Industrial Electropolishing."
By CHARLES L. FAUST, Battelle Memorial Institute.

2—"Electropolishing Silver in Cyanide Solutions."
By DANIEL GRAY, Oneida, Ltd.

3—"Diaphragm Tanks to Eliminate Roughness in Copper Plating."
By R. H. McCAHAN and C. E. MacKINNON, E. I. du Pont de Nemours & Co.

4—"Oxidation of Trivalent Chromium in Chromic Acid Plating Baths."
By ROBERT SEEGMILLER and VERNON LAMB, National Bureau of Standards.

Abstracts of Above Papers

Industrial Electropolishing—Charles L. Faust, Battelle Memorial Institute.
Factors which influence the decision to use or not to use electropolishing will be discussed. Reference will be made to factors leading to the advantages and to conditions causing the limitations associated with industrial electropolishing. Commercial experience will be cited for steel, stainless steel, brass, aluminum, and possibly silver. Actual cost data will be presented on direct charges such as chemicals, labor, electricity, racks, and so on, which can be extrapolated to the electropolishing of nickel or copper, either plate or solid metal.

Electropolishing Silver in Cyanide Solutions—Daniel Gray, Oneida, Ltd.
The primary object of this paper is to give a complete description of a practical method of electropolishing silver in cyanide solutions, including make-up of solutions, operating conditions and the effect of chemical and electrical factors. In addition, this paper will give in simple, non-mathematical language one theory of the mechanism of electropolishing and a definition of the ideal metal to be polished.

Diaphragm Tanks to Eliminate Roughness in Copper Plating—R. H. McCahan and C. E. MacKinnon, E. I. du Pont de Nemours and Company.
A new method for eliminating roughness of cyanide copper electrodeposits has been developed. This comprises the use of a relatively impervious canvas diaphragm separating anode and cathode compartments, continuous high-efficiency filtration from anode section to cathode section, and elimination of exposed metal surfaces in contact with the cathode electrolyte. By this method, combined with adequate circulation or work movement, smooth heavy plates may be obtained rapidly. Full operating details are given .

Oxidation of Trivalent Chromium in Chromic Acid Plating Baths—Robert Seegmiller and Vernon Lamb, National Bureau of Standards.
In those chromium plating operations in which the anode area is necessarily restricted, the concentration of trivalent chromium tends to increase to objectionable values. A study was made of the effects of such factors as the concentrations of hexavalent and trivalent chromium and sulfate, temperature and current density upon the rates of reoxidation of trivalent chromium. From these results, favorable conditions for this reoxidation can be defined.

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Technical Information Manual ZF-1 . . . The New Approach to Zinc Plating.
Technical Information Manual LTF-1 . . . Lead-Tin Alloy Plating from the Fluoborate Bath.
Technical Information Manual CF-1 . . . Copper Fluoborate.

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In Wisconsin: General Chemical Company, Inc., Milwaukee, Wis.

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SECOND SESSION

Tuesday Morning, June 29, 9:30 A.M.

Second Floor Ballroom, Atlantic City Convention Hall

LEONARD WEEG, C. G. Conn, Ltd., Presiding

1—"Description, Design and Production Costs of Conveyorized Spray Finishing System."
By E. PAUL SCHWARTZ, L. C. Smith-Corona Typewriter Corporation.

2—"The Electroplaters' Metals of the Future."
By F. A. LOWENHEIM, Metal and Thermit Corporation.

3—"The Importance of Acid Ratio in the Phosphatization of Steel."
By NELSON F. MURPHY and MICHAEL A. STREICHER, Dept. of Chemical Engineering, Virginia Polytechnic Institute.

4—"Metal Cleaning."
By GEORGE B. HOGABOOM, Consultant.

Abstracts of Above Papers

Description, Design and Production Costs of Conveyorized Spray Finishing System—E. Paul Schwartz, L. C. Smith-Corona Typewriter Corporation.

The conveyorized spray finishing system to be discussed consists of a spray Bonderizing system for Bonderizing steel, aluminum and zinc parts, followed by a gas fired dry-off oven, water wash booths, and a gas fired baking oven. Details, such as temperatures, speeds, and solutions will be included in the paper, and drawings, photographs and a model of the system will be shown.

The steps covered in the design of the system are (1) preliminary studies (2) layout (3) specification of equipment.

Complete data will be available regarding cost of chemicals and labor used for cleaning, and Bonderizing. Data will be presented comparing labor costs of handling and spraying, using trucks with conveyorized handling.

The Electroplaters' Metals of the Future—F. A. Lowenheim, Metal and Thermit Corporation.

This paper is essentially a review of the work which has been reported on the electrodeposition of the "uncommon" metals. A rather thorough literature search has been made, and the salient features are pointed out.

Although the ground covered is similar to that in Dubpernell's "Period Chart for Platers" (Proc. AES for 1946) the approach is different, with more attention to actual details of the plating of the metals.

The Importance of Acid Ratio in the Phosphatization of Steel—Nelson F. Murphy and Michael A. Streicher, Dept. of Chemical Engineering, Virginia Polytechnic Institute.

A study has been made of the effect of acid ratio on the phosphatization of steel. The acid ratio is defined as the ratio of the total acid present to the free acid present.

Factors affected by the acid ratio are: (1) the amount of sludge formed in the bath (2) the formation of the hydrogen blanket on the piece during treatment, (3) the time required for formation of a satisfactory coating, (4) the quality of the coating, and (5) the loss or gain in weight of the treated piece.

Metal Cleaning—George B. Hogaboom, Consultant.

This paper deals with the soils that are on metals to be cleaned rather than with the cleaner itself, the effect of soils upon cleaners, and the best cleaners to be used with different soils. It is also intended to describe a simple test for surfaces that are both physically and chemically clean.

BULLETIN BOARD

4 ITEMS OF INTEREST TO MEMBERS OF THE AMERICAN ELECTROPLATERS SOCIETY 4

Stevens "STANDARD" FULL AUTOMATIC RETURN TYPE SMALL PARTS PLATING MACHINE

Built from the same design as our larger machines which are in nation-wide use, the "Standard" is a general purpose, compact, sturdy machine which provides high production for a small unit; rapid plating; low operating cost per pound or piece; and cleanliness of operation. Dry floors—no wet or slippery duck boards; operator does not work over or around solutions; eliminates expensive items for operators' protection. No overhead hoist equipment; easily and well ventilated; quickly installed.

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Simplicity of design and interchangeability of parts characterize each Stevens Full Automatic Plating Machine.
This illustration shows the double row of carrier arms in various positions in sequence of operation.
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Illustrated folder mailed on request.

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This safety feature is just one of the outstanding reasons why you should buy the Stevens Safety Lathe. Our folder lists many additional outstanding features. Write for one.

Stevens NEW BUFFING COMPOSITION FACTORY

In February we announced the completion and occupancy of our new office building and warehouse . . . the first step in Stevens expansion program.
Next month, in this space, we will announce the second step. It will tell a story of vital interest to the metal finishing industry . . . one you will not want to miss. Watch for it in the July trade magazines.

A. E. S. CONVENTION	OUR REPRESENTATIVES WILL BE THERE TO GREET YOU BOOTHS 57 and 58	ATLANTIC CITY June 28-July 2, 1948

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BUFFING COMPOSITIONS • METAL POLISHERS AND ELECTROPLATERS SUPPLIES-EQUIPMENT

THIRD SESSION

Wednesday Morning, June 30, 9:30 A.M.

Second Floor Ballroom, Atlantic City Convention Hall

GEORGE P. SWIFT, Consultant, Presiding

1—"A Circulating Electrolyte Cell for Strip Plating Evaluation."
By R. A. DIMON, Carnegie-Illinois Steel Corporation.

2—"Bright Barrel Plating of Nickel and Zinc."
By LEONARD A. CHESWORTH, United-Carr Fastener Corporation.

3—"Plating Copper-Zinc Alloys."
By A. KENNETH GRAHAM, Graham, Crowley and Associates, Inc.

4—"The Deposition of Metals on Plastics Employing Reduced Copper Films."
By HAROLD NARCUS, Electrochemical Industries, Inc.

Abstracts of Above Papers

A Circulating Electrolyte Cell for Strip Plating Evaluation—R. A. Dimon, Carnegie-Illinois Steel Corporation.

The paper describes in detail two types of a circulating electrolyte cell which has been used extensively by the author to correlate tests on small batches of electrolytes with commercial strip plating operations in which the strip being plated is being moved through the electrolyte at a high rate of speed. In this cell the electrolyte is pumped between the anode and cathode at a speed corresponding to the rate of strip travel. A resistance melting unit is to be described in which are duplicated the melting conditions used in commercial tin plating lines, as well as a reflectometer by which the lustre of the strips is measured.

Bright Barrel Plating of Nickel and Zinc—Leonard A. Chesworth, United-Carr Fastener Corporation.

This paper will include a description of a barrel plating unit for the plating of bright nickel on small parts to controlled thicknesses of up to 0.00075 inch. The operating conditions, control, and purification procedure being used on a production installation will be detailed. The paper will also describe a zinc barrel plating unit which includes continuous electrolytic purification and a mechanical refrigeration system.

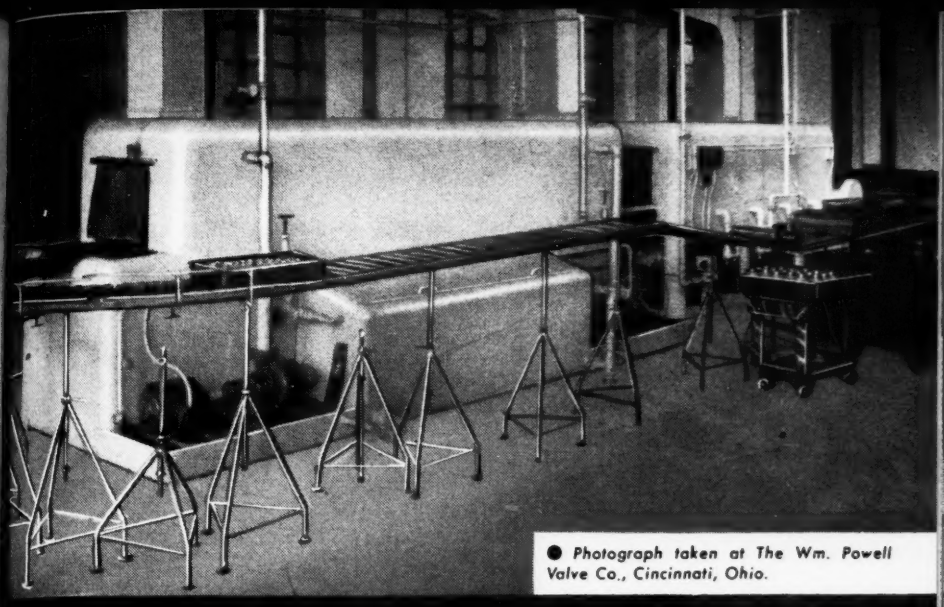
Plating Copper-Zinc Alloys—A. Kenneth Graham, Graham, Crowley and Associates, Inc.

This paper is a report on the electrodeposition of copper-zinc alloys from cyanide plating baths taken from an extensive investigation over a period of twelve years. The author will review the results of published work on this subject and compare them with the results of his investigation.

The paper will describe the deposition of copper-rich copper-zinc alloys and cover the various bronze colors of interest in metal finishing. These alloys can now be plated at relatively high current densities with excellent control of the composition.

The Deposition of Metals on Plastics Employing Reduced Copper Films—Harold Narcus, Electrochemical Industries, Inc.

A new practical method for plating on non-conductive materials, especially synthetic resins, employing reduced copper films in lieu of the presently used silver films is described. The advantages of the use of these copper films over the silver films is discussed in detail with particular reference being made to the results obtained in the finished plated plastic product, to the elimination of ever-present hazards encountered using the more popular silver film, and to the economical aspects.



● *Photograph taken at The Wm. Powell Valve Co., Cincinnati, Ohio.*

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FOURTH SESSION

Wednesday Afternoon, June 30, 2:00 P.M.

Second Floor Ballroom, Atlantic City Convention Hall

HOWARD WOODWARD, Sundmark Supply Company, Presiding

1—"Judging the Quality of Plated Parts."
By WILLIAM M. PHILLIPS and F. L. CLIFTON, General Motors Corporation.

2—"Practical Methods of Cost Finding and Estimating on Metal Finishes."
By ADOLPH BREGMAN, Consultant.

3—"The Spiral Contractometer, a New Instrument for the Measurement of Stress in Electrodeposits."
By ABNER BRENNER and SEYMOUR SENDEROFF, National Bureau of Standards.

4—"Engineering Planning in the Plating Room."
By S. M. MARTIN, United Chromium, Incorporated.

Abstracts of Above Papers

Judging the Quality of Plated Parts—Wm. M. Phillips and F. L. Clifton, General Motors Corporation.

In pursuit of means to determine what constitutes quality of plated parts for various uses, the authors have for many years inspected parts from all makes of automobiles in many locations in the United States and determined the thickness of plate on similar parts of General Motors cars. The results of these studies will be presented in chart form. Interesting data from special roof tests will also be presented.

A new method developed to indicate the combined effect of stress-strain and brittleness will be demonstrated.

Practical Methods of Cost Finding and Estimating on Metal Finishes—Adolph Bregman, Consultant.

Cost finding and estimating are the most important elements of the job or contract electroplater's business. They are complicated by the fact that most job platers do not have suffficient staff to analyze closely every one of the many jobs that they take in. So many jobs are in small lots so that a complete breakdown might cost more than actually doing the work.

This paper describes methods developed in practice among job platers in the New York district. In most cases the figures are based upon the cost of labor, but they also include the tank-hour and the barrel-hour, with due allowance for the cost of special materials such as precious metals, expensive non-metallic coatings, and so on.

The Spiral Contractometer, a New Instrument for the Measurement of Stress in Electrodeposits—Abner Brenner and Seymour Senderoff, National Bureau of Standards.

In this paper a new instrument for the measurement of stress in electrodeposits is described. The instrument is designed for use either in research or in routine testing. In the process of evaluating the instrument, measurements of stress in nickel plates and other deposits were made and are discussed.

Formulas for the calculation of stress are derived and a detailed discussion of the various formulas previously suggested is included. The formulas most frequently used are compared and correlated and the limits of applicability of each are described.

Engineering Planning in the Plating Room—S. M. Martin, United Chromium, Incorporated.

A general resumé of engineering applied to layout and equipment in the plating room is given, covering essential points to be considered when planning new plating room installations and revising or expanding existing facilities. Such items as layout, floor drains, tank ventilation, solution temperature control, equipment maintenance, and safety are discussed.

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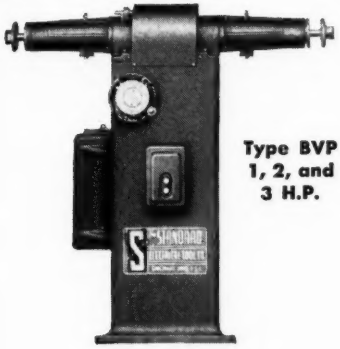

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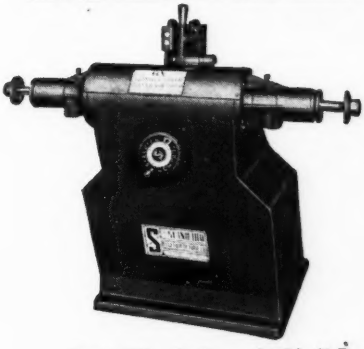

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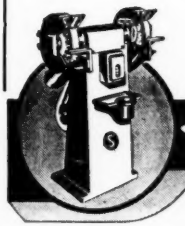

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FIFTH SESSION

Thursday Morning, July 1, 9:30 A.M.

Second Floor Ballroom, Atlantic City Convention Hall

LOUIS WEISBERG, Chairman, Research Directing Committee, Presiding

NOTE—This session is allocated exclusively to the Research Committee of the American Electroplaters' Society for reports on the research activities of the several research projects sponsored by the Society and conducted under the direction of leading metal finishing specialists.

1—Project 5, "Some Effects of Copper as an Impurity in Nickel Plating Solutions and Its Effect on the Salt Spray Resistance of Nickel and Chromium Deposits on Steel."
By D. T. EWING and ROBERT ROMINSKI.

2—Project 6, "Determination of the Porosity and Corrodibility of Electrolytic Metal Foils."
By N. THON and D. K. KELEMEN.

3—Project 7, "The Effect of Internal Stress on Thickness Determination by the Jet Method."
By HAROLD J. READ.

4—Project 9, "Physical Properties of Nickel Deposits."
By ABNER BRENNER and CHARLES W. JENNINGS.

Abstracts of Above Papers

Project 5—"Some Effects of Copper as an Impurity in Nickel Plating Solutions and Its Effect on the Salt Spray Resistance of Nickel and Chromium Deposits on Steel." Dr. D. T. Ewing, Michigan State College, Project Director.

The investigation has been started with nickel plating solutions. Copper, the first impurity to be studied, was found to have a significant effect on salt spray resistance of the coating, an effect not previously recognized.

Project 6—"Determination of the Porosity and Corrodibility of Electrolytic Metal Foils." Dr. N. Thon, Princeton Univ., Project Director.

This project has already indicated that many of the old concepts of porosity may be questionable. While the fundamental purpose is to obtain a better understanding about porosity, there are indications that it may lead to methods for reduction of porosity in electrodeposits, thereby increasing the protective value.

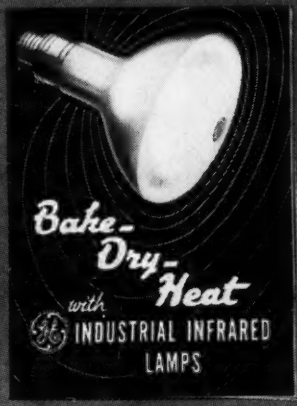
Project 7—"The Effect of Internal Stress on Thickness Determination by the Jet Method." Dr. Harold J. Read, Pennsylvania State College, Project Director.

Preliminary work has already shown that the thickness determination may be affected by stresses in electrodeposits which, in turn, depend upon the variations in plating conditions.

Project 9—"Physical Properties of Nickel Deposits." Dr. Abner Brenner, National Bureau of Standards, Project Director.

This project is engaged in the study of the physical properties of electrodeposits produced under controlled conditions so as to supply necessary data for the engineering applications of electroplating. The project benefits by its location at the National Bureau of Standards which is giving this work its cooperation.

G-E's free bulletin



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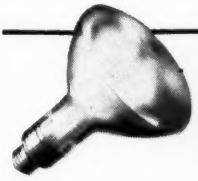

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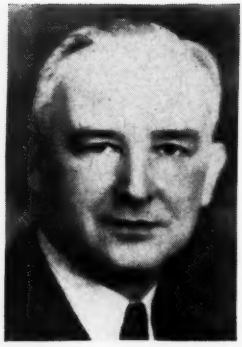

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Program and Entertainment—Paul A. Oldam, Chairman; John Gumm, George Reuter.
Banquet—George Reuter, Chairman; Solomon Barr, William Grigat.
Publicity—William F. Bruhns, Chairman; Robert S. Herwig, Solomon Barr, Charles Muller.
Exhibits (Industrial Finishing Exposition)—George J. Wagner, Chairman; Howard L. Cobb, Co-Chairman; A. P. Munning, John L. De Vries, Carl Greiner, Albert E. Howe, John Lavery.

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A. E. S.

INDUSTRIAL FINISHING EXPOSITION

An outstanding feature of the American Electroplaters' Society's 35th Annual Convention is the Industrial Finishing Exposition to be held in Atlantic City's Convention Hall. Here, more than one hundred manufacturers and suppliers to the metal finishing industry have arranged to exhibit the latest equipment and supplies for electroplating, polishing and buffing, cleaning and degreasing, lacquering and enameling, mechanical washing and rinsing, filtering, deburring, tumbling, and related operations. Specialized and accessory items such as insulating materials and technical instruments for process control and examination of products will be exhibited. At all exhibits, personnel of the exhibiting companies will be on hand to provide complete explanations of the products featured and discuss problems of mutual interest.

A complete list of manufacturers and suppliers appears on the following pages together with the booth number of each display and a floor plan of the Exposition so that the location of each exhibit can be determined.

Truly, the Industrial Finishing Exposition is a "must" for A.E.S. members, foreman platers, shop superintendents, process engineers, and finishing technicians, who will again have an opportunity to see, investigate, and discuss the latest ideas and developments of the entire metal finishing industry. The Exposition is to be open to visitors at 12:00 noon, Monday, June 28 to 5:00 P.M. Thursday, July 1, according to the following schedule.

Date	Open	Close
Monday, June 28	12:00 noon	10:00 P. M.
Tuesday, June 29	10:00 A. M.	10:00 P. M.
Wednesday, June 30	10:00 A. M.	10:00 P. M.
Thursday, July 1	10:00 A. M.	5:00 P. M.

Admission to the Exposition is by trade tickets furnished to exhibitors for distribution to customers and prospects. The public will be admitted only by obtaining tickets at booths and by registering, furnishing credentials.

"CALLING ALL PLATERS"

Be sure to visit the "MUNNING" Exhibit!

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Industrial Finishing Exposition

of

The Electroplaters Society

Convention Auditorium Atlantic City, N. J.

June 28, 29, 30 and July 1

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List of Exhibitors

Firm	Booth No.
Acme Mfg. Co., Detroit, Mich.	52-53-54
A.E.S. Research Committee, Jenkintown, Pa.	19-20
Allied Research Products, Inc., Baltimore, Md.	131
Almco, Division of Queen City Stove Works, Inc., Albert Lea, Minn.	69
Alpha Metals, Inc., Brooklyn, N. Y.	16
Alsop Engineering Corp., Milldale, Conn.	51
American Buff Co., Chicago, Ill.	170-171
American Chemical Paint Co., Ambler, Pa.	106
American Instrument Co., Inc., Silver Spring, Md.	17
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Bart-Messing Corp., Brooklyn, N. Y.	119-120
Beacon Wiper Supply Co., Chelsea, Mass.	15
Behr-Manning Corp., Troy, N. Y.	155-156
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Blakeslee Co., G. S., Chicago, Ill.	162-163
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Colonial Alloys Co., Tech. Process Div., Philadelphia, Pa.	145
Commercial Filters Corp., Boston, Mass.	166
Co-Operative Industries, Inc., Chester, N. J.	151
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Daniels Plating Barrel & Supply Co., Newark, N. J.	104
Darco Corp., New York, N. Y.	27
Detrex Corp., Detroit, Mich.	67-68
Die Castings Magazine, Cleveland, Ohio	21
Diversey Corp., The, Chicago, Ill.	30-31
Divine Brothers Co., Utica, N. Y.	25-26
Duggan Masking Devices, Detroit, Mich.	35
Duluth Buff Co., Chicago, Ill.	141
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Finishing Publications, Inc., New York, N. Y.	29
Formax Mfg. Corp., Plant No. 2, Detroit, Mich.	122
Gardner Publications, Inc., Cincinnati, Ohio	42-43
General Chemical Division, Allied Chemical & Dye Corp., New York, N. Y.	40
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Minnesota Mining & Mfg. Co., St. Paul, Minn.	70
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Solventol Chemical Products, Inc., Detroit, Mich.	112-113
Sparkler Mfg. Co., Mundelein, Ill.	23

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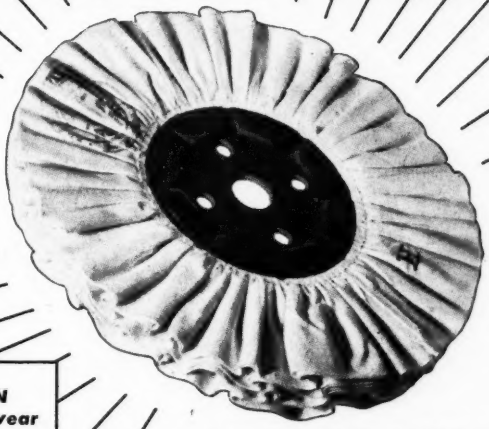

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LIST OF EXHIBITORS—*Continued*

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Wagner Brothers, Inc., Detroit, Mich.	134-135
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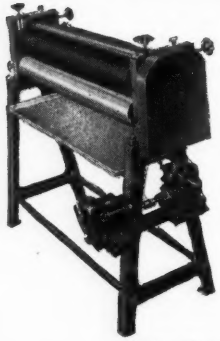

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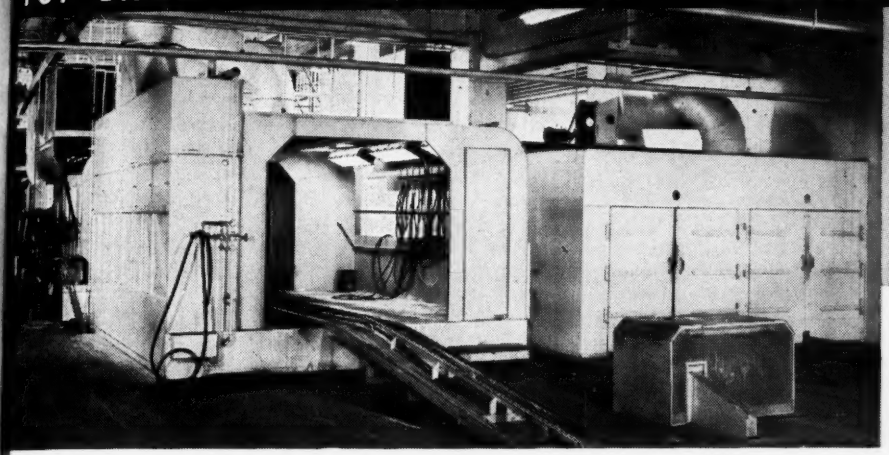

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Every Mahon Finishing System is planned and engineered to meet the individual production requirements of the manufacturer—right from the metal cleaning and rust proofing phase, through to final coat drying or baking. The reputation of Mahon planning engineers is unequalled in this highly specialized field. That is why so many manufacturers all over the world turn to Mahon for equipment to produce the finest finishes . . . they know that twenty-seven years of experience, together with constant research and pioneering development, have endowed Mahon engineers with a wealth of technical knowledge and practical know-how not available elsewhere. See Mahon Insert in Sweet's Mechanical Industries File for complete information, or, if you have finishing problems now, or contemplate new finishing equipment in the near future, arrange a consultation with Mahon engineers today.

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AHON

Finishing Clinic

Thickness Measurements of Plated Coatings

THERE are many factors which enter into the serviceability of a metallic coating on metal products, such as continuity and uniformity, its physical and electrochemical relationship to the base metal, the character of the environment to which it is exposed, and the nature of the corrosion product which the metallic coating forms in its chemical reactions with the constituents of that environment. Experience has shown that the performance to be expected from a metallic coating may be indicated by studies of the quality of the coating and from various types of corrosion tests.

Thickness is indicative of the quality of any metallic coating, and includes average thickness as well as variations in uniformity of thickness. Other important properties of metallic coatings are porosity or continuity of the coating produced, adherence to the base metal, flexibility or ductility of the coating, and in some cases, the presence of impurities in the coating. When the performance of a metallic coating in a given environment is known, either from experience with actual life tests or from simulated corrosion tests, it becomes a relatively simple matter to control the quality of the product, and thereby predict its performance by means of physical or mechanical tests for coating thickness, distribution and continuity, and other factors such as adhesion and ductility. Tests of ductility and adherence of coatings are made when these qualities are likely to have a bearing upon performance.

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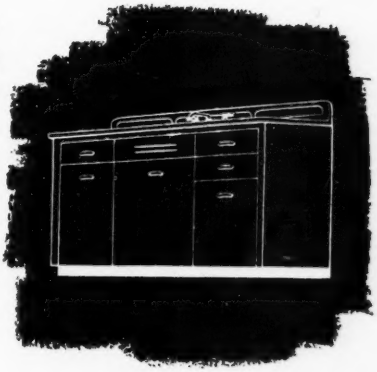

APPLICATION:

One coat, consisting of two spray passes.

BAKING TIME:

20 minutes at 300° F. (or equivalent).

All Vedoc finishes are developed for a specific use, then slightly varied to best fit into each customer's setup. Write today for more information about these "better finishes". Also, ask for your copy of the new booklet, *A Review of Product Finishing with Organic Coatings.*

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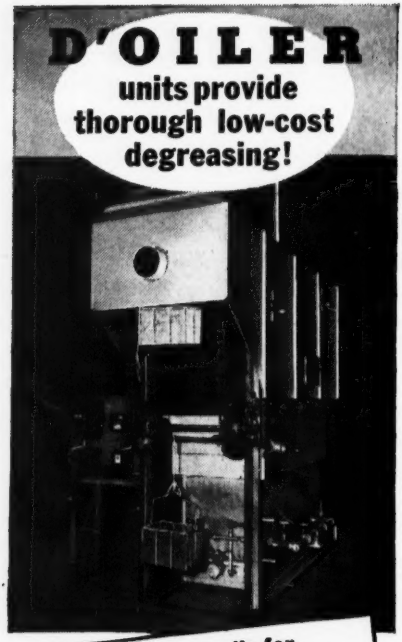

If the job calls for a degreaser—there's a D'Oiler for the job!*

D'OILER engineers — pioneers in solvent degreasing and de-oiling—have developed a D'OILER model for every purpose . . . volume work and small batch dips, hand-operated or automatic, one dip or three dip, vapor spray machine or custom-built devices for special jobs. Illustrated above is a three dip automatic for batch degreasing of small parts.

Avoid the pitfalls of improper degreasing methods by getting the expert recommendations of our technical staff.

*There are metal cleaning problems which are solved by methods other than degreasing; we shall inform you frankly and thoroughly of the methods best suited to your operations.

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Mechanical
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Numerous researches and corrosion tests confirmed by experience have shown that the thickness of electroplated coatings is one of the most important single factors in their resistance to wear and corrosion. This property is most logically expressed in terms of minimum thickness on "significant" surfaces, meaning those areas that are visible and subject to abrasion and corrosion. The specification of average thickness is confined largely to coatings of metals such as gold and silver, the intrinsic value of which is an important consideration.

Average Thickness

Methods for determining the average thickness of plated coatings depend upon solution of the coating. If this can be done without significant attack of the base metal, the loss in weight equals the weight of the deposit, from which weight and the area and density of the coating its average thickness may be computed. If the base metal is attacked, it is necessary to determine the weight of coating by analysis of the resulting solution. For most plated coatings, stripping methods have been worked out that are quantitative within about 10 per cent.

Local Thickness

Methods for determining the local thickness of protective coatings depend on (1) linear measurements; (2) rate of a chemical reaction; and (3) magnetic methods. The methods of measuring local thickness are of more interest at present than the methods of measuring average thickness, as the tendency in specifications is to require a certain minimum thickness of coating on any significant surface. The local thickness methods, with the exception of the microscopic methods, have an added advantage, in that they are usually more rapid than stripping methods and usually non-destructive.

The microscopic method involves the microscopic measurement of a sat-

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PAINT-LADEN AIR IS "TORNADO" CLEANED. Operators, working in a Schmieg Centri-Merge Spray Booth, are adequately protected from fire and fumes. Overspray is carried on an air stream *horizontally* away from work into a curtain of water, pressure-fed through slots extending continuously full width of booth, that descends down the flood sheet. The mixture of fume and paint-laden air and water is then whirled under the flood sheet and hurled with tremendous impact against the impingement wall at back of booth. Down this impingement wall flows an additional sheet of water that floods the foreign matter, pounded out in the process, into the sludge tank below. Only CLEAN AIR passes through exhaust fan. Thus the danger of fire is suppressed both in front and behind the flood sheet. Because the ratio of water and air is far greater in Centri-Merge, paint and other gummy substances do not pile up on the hard-to-get-at walls of the chamber behind the flood sheet; therefore, cost of repeated cleanings is eliminated.

Consult Schmieg engineers regarding your problems of dust and fume control.

THE *best* AIR PURGE *is* CENTRI-MERGE

Schmieg INDUSTRIES INC.

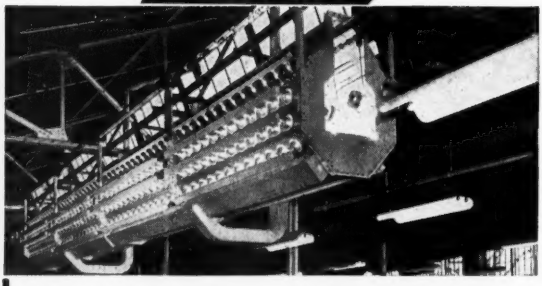
Engineers & Manufacturers

isfactory cross-section, and is sometimes used in specifications. With thicknesses down to 0.0001 inch, the accuracy of the method is generally thought to be about ± 5 per cent (see also "Monthly Review," Am. Electroplaters' Soc. 23, 5, 1936).

The chord method depends upon just cutting through the coating on a curved surface with a flat file, or on a plane surface with a precision grinding wheel, and measuring the width of the cut . A formula has been provided for determining the coating thickness (see also J. Research Natl. Bureau Standards 16, 1936). While this method destroys the coating, the base metal can usually be stripped and replated. With coatings down to 0.0002 inch, the accuracy has been estimated at about 10 per cent.

In methods for thickness determinations, based on the rate of a chemical reaction, immersion methods such as represented by the Preece test, and spot tests are employed, wherein one drop of a reagent is applied to the plated surface, and the time required for its complete solution is noted. One example of the latter of the above methods is the measurement of thin chromium coatings by applying one drop of concentrated hydrochloric acid to the surface. The temperature and concentration of the hydrochloric acid must be controlled rather closely to attain an accuracy of ± 10 per cent. In dropping tests a stream of drops of an appropriate reagent is allowed to fall onto the plated surface at a controlled rate, and the time required for penetration of the coating is noted. This method is particularly useful for metals such as zinc and cadmium. Jet methods of thickness measurement are based on a test where a continuous, fine stream of a reagent is allowed to impinge on the surface until the coating is penetrated, as determined by observation, when the stream is in-

HALL Radiair INFRA-RED OVENS



One of several similar ovens at the plant of a large radiator manufacturer in western New York. This oven is used for water dryoff and paint bake on heater cores and cases.

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There is a scientific Pennsalt Product for practically every metal cleaning requirement. Each is tailored to do a specific job, and do it well. In addition, you can call on the help and experience of a large staff of technically trained experts to help you improve finish or lower costs. Turn your problems over to *Special Chemicals Division, Pennsylvania Salt Manufacturing Company, 1000 Widener Building, Philadelphia 7, Pa.*

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METAL CLEANERS

terrupted at intervals. Included also in this group are electrochemical methods, where the thickness of a coating is determined by measuring the time required for it to dissolve, anodically, at a specified current density. One example is the measurement of the thickness of chromium coatings by making them anodic in a solution of trisodium phosphate and sodium sulfate (see also Trans. Electrochem. Soc. 78, 1940).

An electrolytic thickness tester which permits accurate measurements of the thickness of electrodeposited coatings has recently been developed at the Armour Research Foundation. The principle of the instrument is the anodic dissolution of a defined area of the plated metal, using the current-time product as a measure of the thickness. The stripping current is held constant during a test and the removal time is automatically indicated (see also J. of the Electrochem. Soc., March 1948). The electrolytic thickness tester is reported to be particularly well suited to very thin coatings. Plating thicknesses of from a few

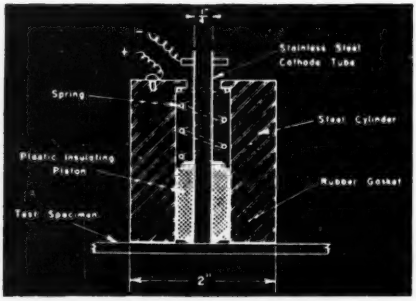

Fig. 1—Stripping cell for electrolytic thickness tester developed at the Armour Research Foundation
(Illustration courtesy J. Electrochemical Society)

millionths of an inch up to several ten-thousandths have been measured quite satisfactorily. For coatings heavier than about 0.0005 inch, however, the time required becomes rather long, and other methods can be used.

Figure 1 shows the design of the

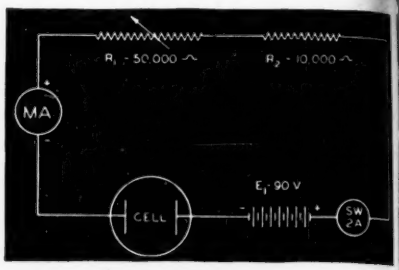

Fig. 2—Basic circuit for electrolytic stripping tester
(Illustration courtesy J. Electrochemical Society)

stripping head of the thickness tester. The weight of the external metal cylinder forces the piston against the plated surface of the test specimen. The rubber gasket provides a tight seal against leakage of the electrolyte. The center tube serves as the cathode of the cell, while the plated metal is the anode. The basic circuit of the thickness tester is shown in Fig. 2; a 90-volt battery is used as the source of cell current which is suitably regulated and metered by the other components. It should be pointed out that it is this feature of the apparatus which assures practically constant stripping current, since small voltage changes across the stripping cell are negligible, compared to the 90-volt battery. The circuit can be adapted to form an automatic plating weight tester.

Coatings that have been successfully measured include tin, zinc, lead, cadmium, copper, chromium, silver, gold, and brass on steel; and tin, zinc, lead and chromium on brass or copper. The electrolytes used for the coatings mentioned were 10 per cent sodium hydroxide or 10 per cent sodium cyanide, de-

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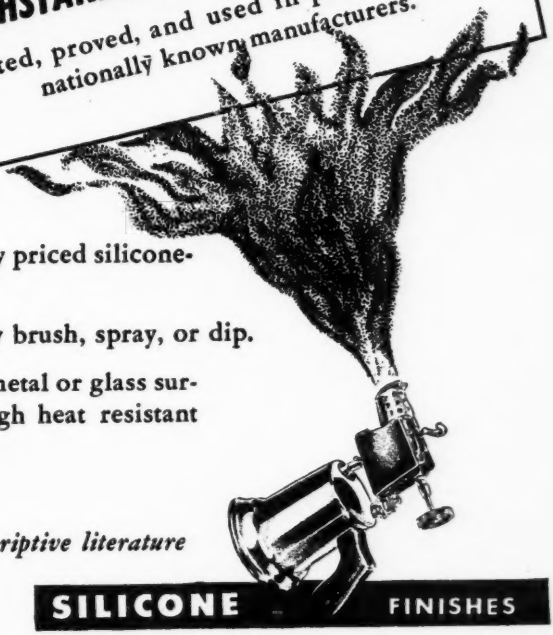

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On plated parts Iridite forms a long lasting, sparkling *bright* finish that *stays bright,* even after handling, storage, exposure. On all surfaces, Iridite can be used to produce a variety of colored finishes.

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Resistant to the attack of water, gasoline, and ordinary corrosive conditions, Iridite provides the ideal *final finish* for all zinc and cadmium surfaces.

3. BASE FOR PAINT . . .
On any zinc or cadmium surface that must be painted, Iridite insures a better finishing system because the coating improves initial paint adherence, blocks corrosion *under* paint, blocks metallic soap formation *between* paint and metal.

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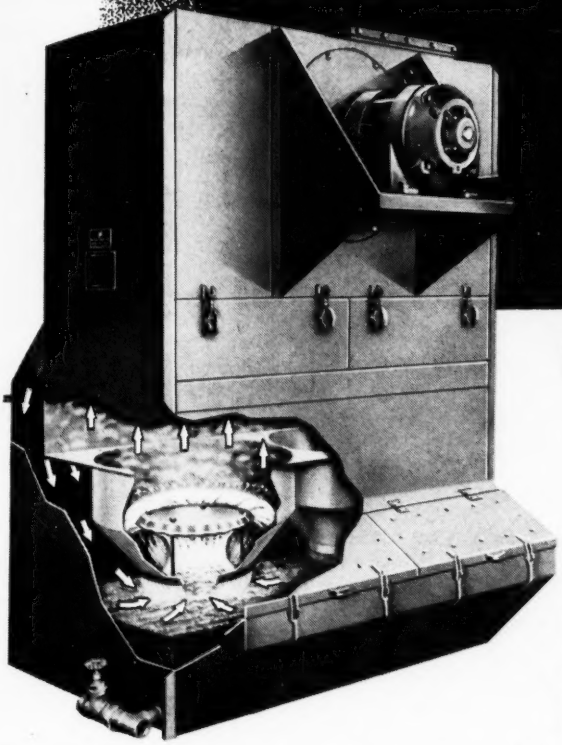
pending on the chemistry of the metals. The alkali soluble metals include tin, lead, zinc, and chromium, while the cyanide soluble metals are cadmium, copper, silver, gold, and brass. Silver and gold cannot be determined on brass or copper, and a satisfactory electrolyte has not been found for nickel. The accuracy of the instrument has been reported to be high. For example, 30 micro-inches of tin on steel can be measured with a precision of ± 2 per cent.

Magnetic methods provide the basis for determination of the thickness of an electroplated coating by means of a rapid, non-destructive test, which is accurate to 10 per cent for coatings heavier than 0.0002 inch. Two types of instruments are used for magnetic thickness testing. One type of instrument uses a permanent magnet, the attractive force of which is measured by a spring. The magnitude of the attractive force between the plated surface and the magnet is dependent on the thickness of the coating. A second type of instrument is electro-magnetic. It measures the thickness of non-magnetic coatings on steel by the amount the flux of a magnetic circuit is reduced by the coating when it comes between the pole pieces of the core and the steel base metal. These readings are registered directly by an ammeter.

Magnetic testing can be used in the production line for three purposes: (1) to measure the thickness of magnetic coatings, such as nickel, plated on non-magnetic base metals, such as brass or zinc base die castings; (2) to measure the thickness of any non-magnetic coating, such as copper, zinc, cadmium, silver and so on, on steel; (3) to measure the thickness of slightly magnetic coatings, such as nickel, on steel.

The Magne-Gage, developed at the National Bureau of Standards and manufactured by the American In-

NEWCOMB-DETROIT



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The Uni-Wash Dust Collector collects dust-laden air, water washes it twice, dries the air and then discharges it *within one compact unit.* The water is continuously recirculated by suction from the exhauster fan . . . no pump to clog and maintain. Another important feature—all dirt is removed from the air before it reaches the fan, thus reducing fan maintenance.

Uni-Wash Dust Collectors are assembled units . . . installation requires the connection of a power line, water source and drain only. These units are available in capacities from 500 to 30,000 CFM. They may be used individually or in combination to meet the requirements of any dust condition.

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strument Company, is an instrument utilizing a permanent magnet (see also J. Research N. B. S. 18, 1937; 20, 1938). An illustration of the commercial form of this instrument is provided in Fig. 3. The use of the instrument for measuring nickel coatings on non-magnetic base metals depends on the fact that nickel is magnetic and

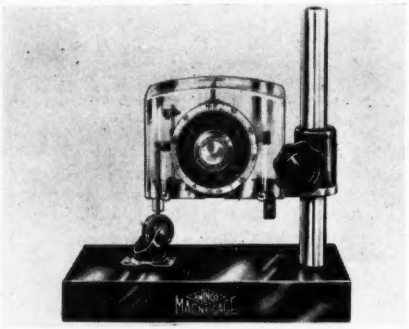


Fig. 3—The Aminco-Brenner Magne-Gage with test specimen in place
(Photo courtesy American Instrument Co., Silver Spring, Md.)

that the attractive force between the magnet and the coating is proportional to the thickness of the coating. The method for the measurement of non-magnetic coatings depends on the fact that the attractive force between a magnet and steel is decreased by an intervening layer of non-magnetic material. This decrease in attractive force is larger, the thicker the intervening layer. Nickel coatings on steel, such as outlined in method three above, can be measured in the same manner as non-magnetic coatings, because nickel is less magnetic than steel.

The electromagnetic type of thickness measurement instrument operates on the principle that any non-magnetic material applied to an iron or steel base constitutes an air gap interposed between the magnetic base and the two magnetic pole tips, or flanges, of the gage head. Thus when the pole tips, or flanges, of the gage head are placed against the surface of the non-magnetic material, the magnetizing current in the gage-head coil sets up a magnetic flux, which "threads" through the iron core of the gage head, across the two small air gaps imposed by the non-magnetic material, and through the steel base material. The gage head is connected into an electric bridge circuit and forms one arm. Another reactor, similar to the gage head, is located inside the control unit, and forms another arm of the bridge circuit. The electric impedances of the two arms are balanced against each other. As the impedance of the gage head changes, it affects the balance of the bridge circuit. The indicating instrument, connected to the bridge circuit, indicates the unbalance, and is calibrated to read the thickness of the non-magnetic coating on magnetic steel parts. A thickness gage of this type is manufactured by The General Electric Company.

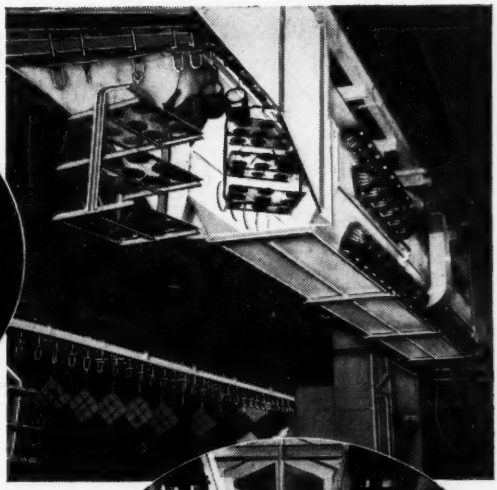
According to information supplied by The General Electric Company, the accuracy to be expected when gaging the thickness of a coating on a flat, soft-iron magnetic base should be within ± 10 per cent of the instrument reading, within the range of 0.0003 to 0.010 inch. When calibrations are made with the arbitrary scale and the thickness standards, accuracies of the order of 5 per cent of the instrument reading on this range can be expected. For the range of 0.0001 to 0.0003 inch, it is reported that the instrument reading will usually be accurate within 20 per cent.

* * *

Coverage Tests of Finishing Materials

ONE point having an important bearing on the overall cost of an organic finish on a metal product is the square feet of surface each gallon

G-W Overhead Trolley in a Radiant Heat Tunnel



Relieve congested floor areas— put handling jobs on the ceiling

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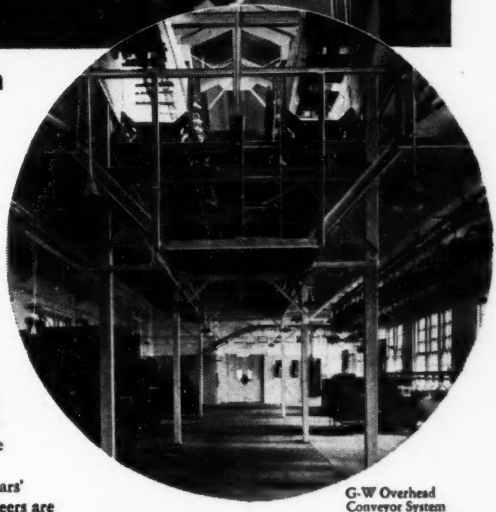

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Practical expansion of work areas without enlarging your plant is what you actually achieve when materials handling operations are put overhead. Gone are congested floor spaces with ever present production slow-ups and safety hazards. Efficiency, order, and lowered handling costs result.

Standard G-W conveyor units will handle most industrial operations for both work in process and finished products. Transportation of raw materials and parts, shifts from floor to floor, moves between operations—all can be coordinated in one G-W System.

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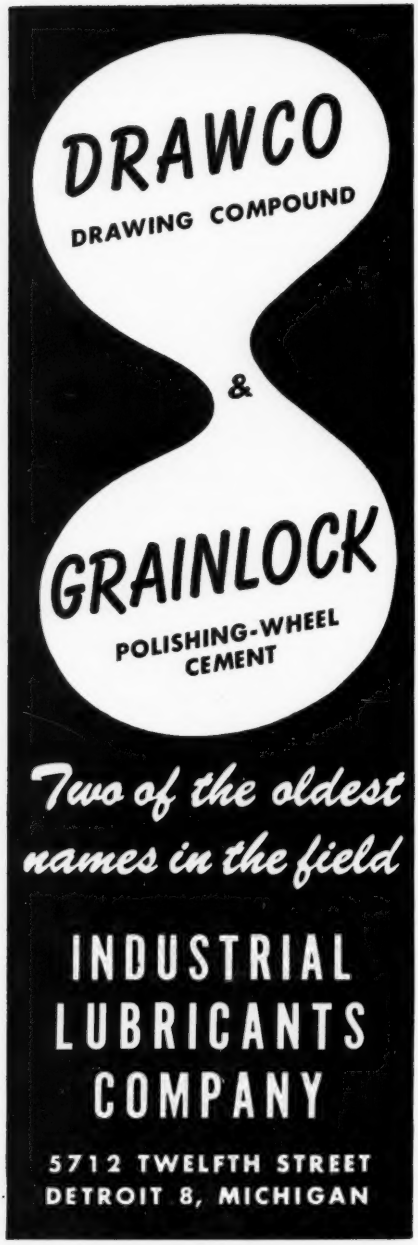
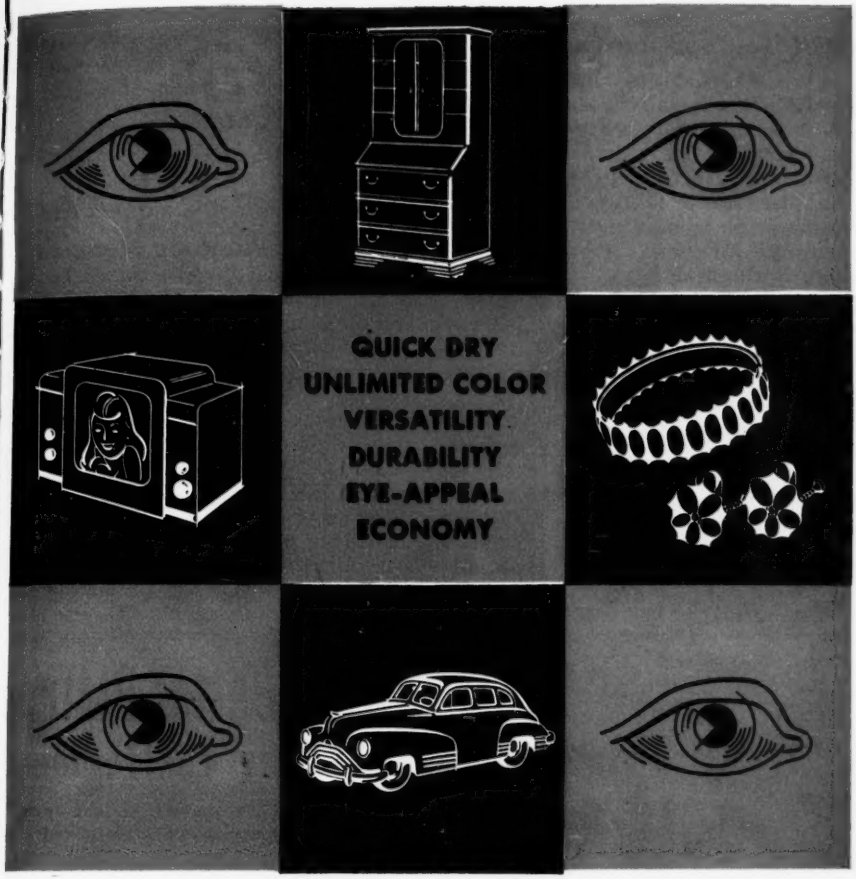


of material will cover at a satisfactory film thickness for durability and appearance. The square feet at unit thickness the finishing material will cover, provided none of the film building solids are lost during application, is often determined in the laboratory on new finishing materials. It is valuable to compare the possible spread of new materials and production coverage results.

To calculate the theoretical coverage of a finishing material per gallon, it is necessary to know the weight of film building solids per gallon and the density of the dried film. To obtain sufficient data, the weight per gallon and the per cent solids is accurately determined. In one experimental procedure, the finishing material is applied to weighed smooth-surfaced panels, baked, again weighed, following which the film thickness is accurately determined. From the weight in pounds per gallon, and the per cent solids, the pounds of film building solids can be calculated. From the weight of dried film on the panel of known area, and the determined film thickness, the weight of the solids material per cubic inch can be calculated. Thus, the weight of solids per gallon when divided by the weight in pounds per cubic inch, gives the volume of the film building material. Likewise, from the volume of solids, it is a simple matter to convert to square feet spread at any desired thickness. One source of error in the above procedure is the method of film thickness measurement and of obtaining a uniform film thickness in the coating process. Other laboratory methods are available for determining film density.

During production application and plant trial run tests, it is desirable to keep records of the amount of material consumed per unit, the film thickness obtained, and eventually convert the results into square feet coverage per unit thickness.



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Hercules does not make lacquers but materials from which they are made. Consult your lacquer supplier.

Spot Test for the Detection of Cadmium Plate

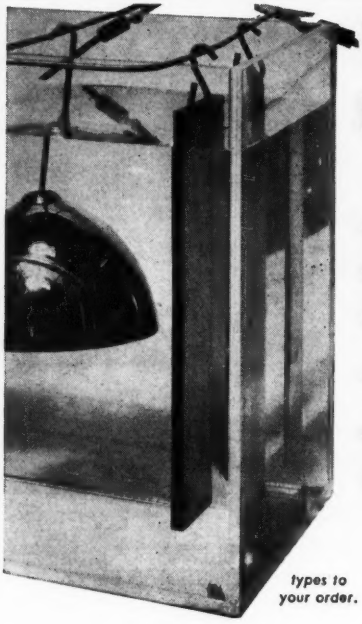
THERE are many instances in the finishing department when it may be desirable to have a spot test to determine if a certain coating is cadmium plate or to distinguish between cadmium plate and zinc plate. Karl A. Jorczak, American Bosch Corporation, Springfield, Mass., has recently described in "The Chemist Analyst," published by the J. T. Baker Chemical Company, a rapid spot test for cadmium requiring only two minutes at the most to perform.

In carrying out the recommended procedure, a small portion of the surface of the material to be tested is cleaned. Two drops of 20 per cent hydrochloric acid are then placed on the cleaned surface and a small crystal of sodium sulfide is added. If cadmium is present as the surface coating, a yellow residue of cadmium sulfide will be formed. Zinc plate will give no color reaction with this test, due to the fact that any zinc sulfide that might be formed will be white.

* * *

Nitrocellulose Lacquers Are Versatile Finishing Materials

IN discussing modern trends in the protective coatings industry before the Golden Gate Paint and Varnish Production Club last year in San Francisco, D. K. Wiggam, Hercules Powder Company, traced the development of the large new market for protective coatings which was built up between the two wars, most of which was to satisfy the needs of industrial finishers. The spark which set off this enormous growth was the discovery that nitrocellulose lacquer was a satisfactory medium for production of excellent fast-drying finishes (see also



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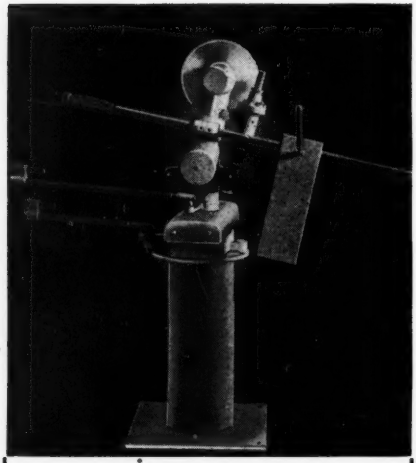

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"Paint, Oil, and Chemical Review," Vol. 110, No. 17, 1947). Thus, from the general group of cellulosic base materials have been developed the quickest air drying metal coatings the industrial finishing industry has ever used. Probably of most importance, as far as nitrocellulose lacquers are concerned, is the fact that they dry in a matter of minutes, at room temperature, to provide hard, adherent, durable protective coatings which can be polished to a very high gloss. It was pointed out by Wiggam that present day nitrocellulose lacquers are composed, essentially, of a cellulose derivative, resins, plasticizers, solvents, and pigments. The resins are necessary for adhesion to surfaces and for gloss; the plasticizers to impart flexibility; the pigments to impart the desired color; and the solvent to make it possible to apply the mixture in desirable thicknesses. The cellulose derivative, which is a high molecular weight, long-chain polymer, acts like embedded wires in the media. It imparts toughness to the system and at the same time has the desirable effect of raising the melting point of the system.

Within the past year or two, it was pointed out by Wiggam, considerable interest has been shown in metallized lacquer coatings containing iron oxide. Metallic aluminum is dispersed in the lacquer at relatively low concentration and with it some hydrated iron oxide is used. Light is reflected from the surface of the embedded metal particles, and is broken up by the iron oxide, so that an impression of depth of luster is created.

Although lacquers are generally applied by spraying, suitable formulations have recently been developed which can be applied by brushing, similar to the practice with paints and varnishes. Some of the newer solvents that have been developed impart improved brushability and are much less objectionable from the odor stand-

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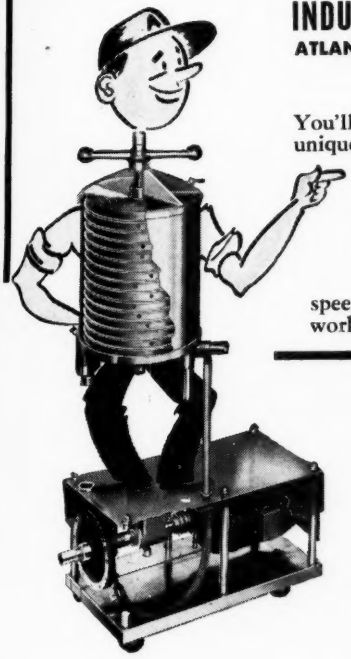

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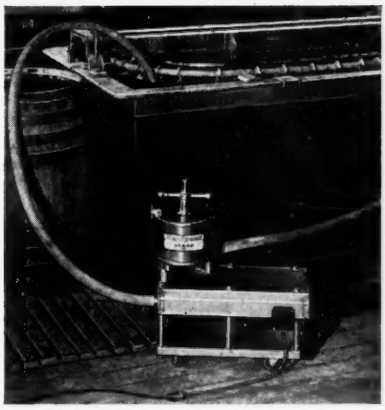

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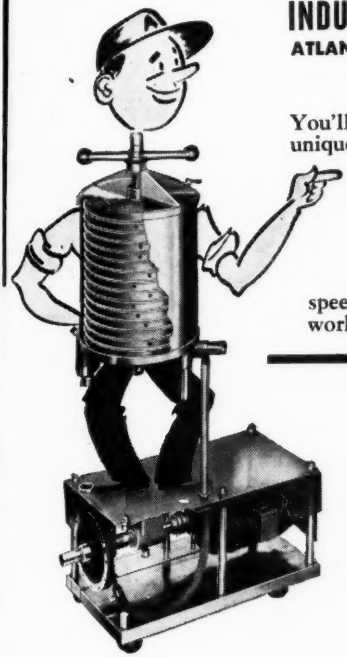

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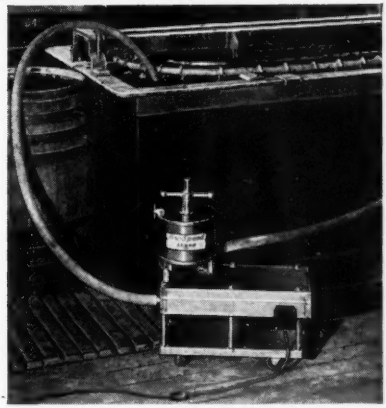

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Table I—Formulation of a Pigmented Brushing Lacquer

Materials	Parts by Weight Lacquer	Volatiles
Nitrocellulose, RS 30-35 cp.*	7.6	
Lewisol 33	4.55	
Aroplaz 905 (solid)	6.85	
Castor oil, raw	1.9	
Flexol DOP	1.9	
Titanium dioxide (R610)	15.2	
Cellulose acetate	21.7	35
Methyl Carbitol	6.2	10
Ethyl alcohol	9.3	15
Isopropyl alcohol	12.4	20
Amsco F	12.4	20
Totals	100	100
Total solids, per cent	38	

Tests	Test Data
Drying time, to touch (minutes)	120
Viscosity, seconds (No. 4 Ford cup)	50

*Dry Weight.

point. Shown in Table I (courtesy "Official Digest," Federation of Paint & Varnish Production Clubs), is the formulation of a good pigmented brushing lacquer as given by Wiggam.

The adhesion of lacquers to clean metal is good and can be bettered by suitable primers. The integrity of the lacquer film after exposure periods upon plated metals is good. Chemical resistance of nitrocellulose lacquer coatings is generally considered satisfactory against aromatic solvents and alcoholic beverages; however, it has been reported that attack has been evidenced on exposure to alkalis. Thus, in the production finishing department the value of nitrocellulose lacquers is evidenced to the highest degree in applications where chemical resistance requirements are moderate, production requirements are high, decorative values of importance, and baking facilities undesirable, unavailable, or unobtainable.

Slot Plating Test Cell

MOST platers concerned with optimum operation of plating baths recognize the value of proper plating range test methods and are always interested in the development of new types of plating test cells which can be applied in day-to-day control procedures. A plating range test can be devised by any means that will provide a change in current density over the length of a cathode. One means of doing this is to bend the cathode toward the anode so that it is relatively difficult for the current to deposit metal in the vicinity of the bend. This is generally known as the bent cathode test. Another test that is popular among production platers is the Hull Cell test which makes use of an inclined cathode, upon which the current density decreases as the distance from the anode increases. The practical application of these methods to produc-

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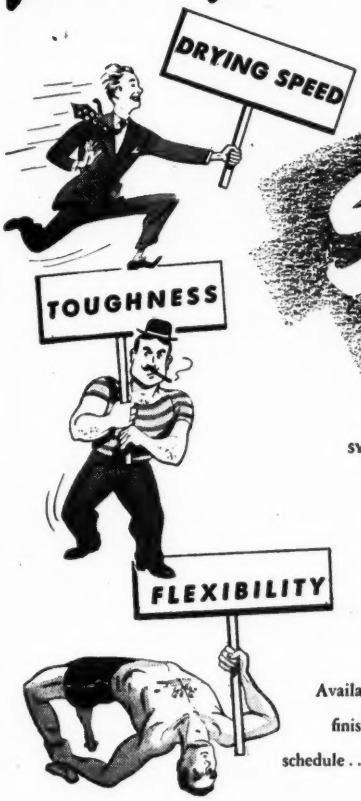

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tion control procedures has been brought out in these columns (see PRODUCTS FINISHING, August 1947).

It has recently been pointed out by J. B. Mohler that a very useful type of plating range test cell may be made

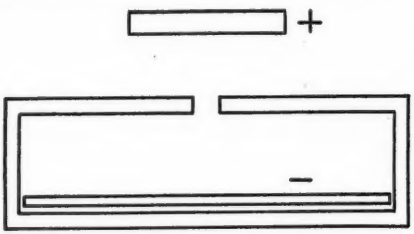

Fig. 4—Immersion type slot plating range test cell
(*Drawing courtesy "The Iron Age"*)

by plating through a slot (see also "Steel," Nov. 3, 1947, and "The Iron Age," Dec. 4, 1947). This type of cell, termed the slot plating range test cell, is based on the principle that if a plating current is allowed to pass through a slot, the current density along the cathode will drop as the distance from the slot becomes greater. The current distribution will be of a logarithmic form and a plating cell constructed on this basis is thus of value for practical plating range tests.

According to Mohler, the slot cell has the advantage that the size and position of the anode has no effect on the current distribution inside the cell. Furthermore, the immersion type of slot cell, such as shown in Fig. 4, can be hung directly in the plating bath or suspended in a beaker. It has been pointed out that this arrangement is convenient, since it overcomes the objection of temperature control. The slot cell can be varied to meet the demands of plating range tests. Shown in Fig. 5 is a slot cell of the box type. The cells can be considered to be dimensionless. Thus, it can be seen that a ¼-inch slot, 1 inch from an 8-inch cathode, will cover the same range as a ½-inch slot, 2 inches from an 8-inch cathode. Since the cells are dimensionless, and since the size of the anode compartment has no effect on the cathode, it was pointed out by Mohler that cells can be constructed to accommodate any size cathode and any volume of solution. Thus, a 4-inch cathode is convenient as a relatively small cell yet with a cathode large enough for easy reading; likewise, a 2-inch cathode would be appropriate for experimentation with expensive solutions, and an 8-inch cathode would be useful for calibration of cells or for precise current distribution studies.

For precise plating range work, a multiple-slot-cell can be used that will produce a linear relation for the change in current density along the length of the cathode. This cell does not have the wide range of the single slot but is particularly useful for research work and for determining and checking plating range diagrams. The value of the cell lies in easy and accurate determination of exact plating current densities.

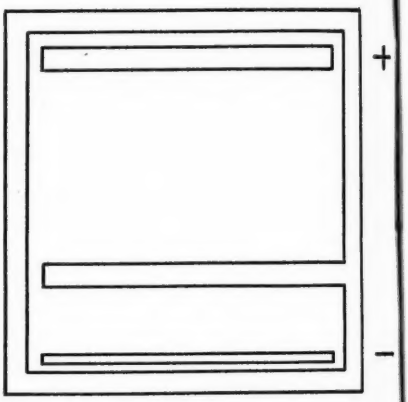

Fig. 5—Box type slot plating range test cell
(*Drawing courtesy "Steel"*)

Diagrams of a multiple-slot plating

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range cell and its current density characteristics are shown in Figs. 6 and 7 respectively. The multiple slot

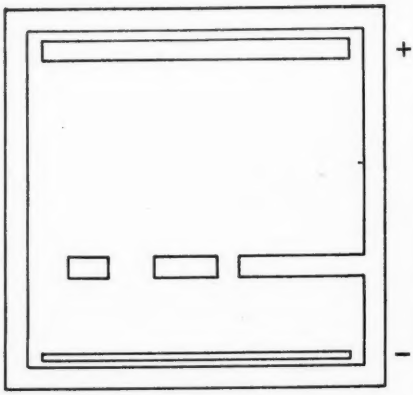

Fig. 6—Diagram showing multiple-slot plating range cell

cell shown was calibrated for acid baths of average throwing power, such as nickel or lead. For precise work with baths of very high or very low throwing power, further calibration would be necessary.

The immersion type of slot-cell has been found to be particularly adapted to control of plating range of chromium plating baths. Probably the most important factor contributing to the successful operation of chromium plating baths in regular production is the plating range of the solution; herein lies the ability of the plating bath to provide a uniformly bright deposit over a wide variety of irregular objects. The electrolyte for chromium plating consists originally of only two constituents: chromic acid and a small amount of a catalyst acid radical, usually sulfate, added as sulfuric acid. For successful operation of chromium plating baths at conditions of optimum plating range, to maintain the maximum throwing power, it is essential that the ratio (by weight) of chromic acid to total catalyst acid radical (sulfate) be accurately controlled and maintained within definite limits ("Modern Electroplating"). A plating range test applied to this bath is thus a rapid measure of this ratio.

In the application of the slot-cell to chromium plating solutions, the chromium is deposited on clean copper sheet. The method of cleaning and whether or not the copper is etched have little effect on the width of the bands obtained in the test. It is well to run a set of standards and preserve them for reference in all future tests. Thus, this test should be looked upon as a means of controlling the plating range at a maximum where the control is expressed in terms of the chromic acid-sulfate ratio. This ratio expression is useful, since it provides information on the amount of acid to add to change the plating range. The plating test also has certain advantages over chemical analyses for chromic acid and sulfate to determine the ratio. Since two careful chemical

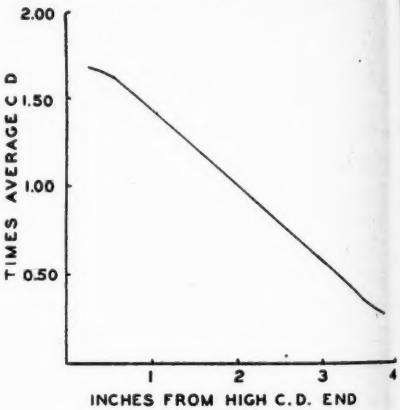

Fig. 7—Diagram showing current characteristics of a multiple-slot plating range cell

analyses are involved in the determination, even rapid analytical methods may not permit operation at maximum conditions at all times.

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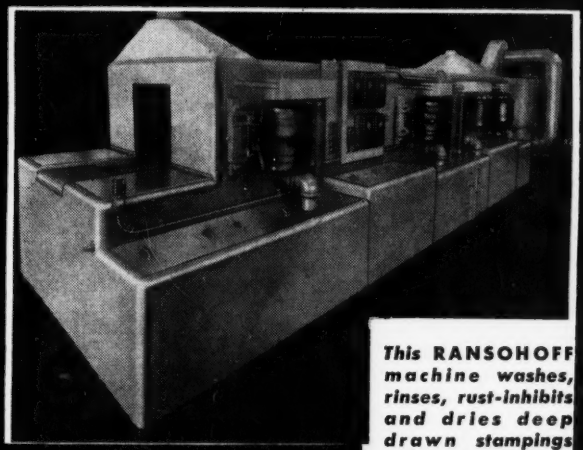

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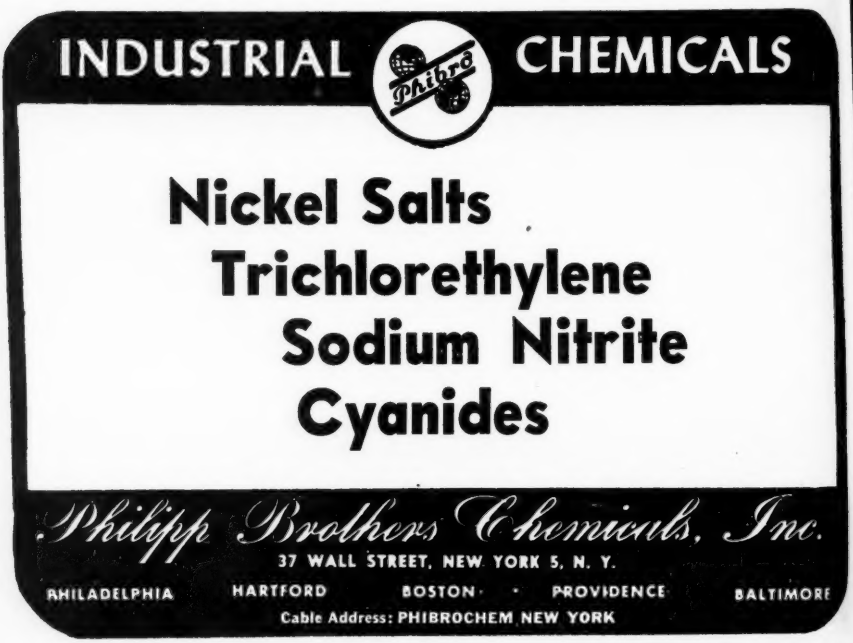
From a test plate it can readily be judged if the sulfuric acid is low. A narrow band will be produced on the test plate, just as is the case for baths high in sulfuric acid, but in the former solution green compounds of chromium will appear at the edges of the band.

It should be remembered, in setting up production control methods, that the direct measurement of plating range is the best overall measurement that can be made on a plating bath. In practical applications, such a measurement can be used to eliminate or minimize the requirements for chemical analyses, as was pointed out above. Such control tests are usually best interpreted by means of standards on a particular bath. Often these standards merely consist of a few plates from a properly operating bath as a reference. Interpretation of effective addition agent concentration, a shift in plating range, or off-color deposits within the plating range can best be made as a result of experience with the bath. Certain interpretations are possible from a general knowledge of the chemistry of the bath; however, the best interpretations come through the day-by-day accumulation of typical plates which, together with a log of the bath, make possible more rapid control and correction of plating baths in the production line.

Hammond Abrasive Belt and Wheel Grinding, Polishing, and Deburring Machinery is the subject of a 20-page three-color catalog published by Hammond Machinery Builders, Inc., Dept. GP-25, 1600 Douglas Ave., Kalamazoo 54F, Mich. Shown and described are flexible abrasive belt grinder-polishers, abrasive belt grinders, abrasive belt grinder-polisher combinations, polishing and buffing lathes, wheelheads, backstands, and other machinery, as well as a wide variety of accessories. Copy of Catalog No. 325 free.



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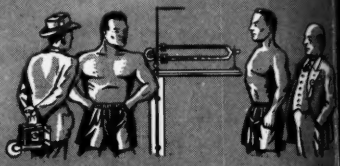

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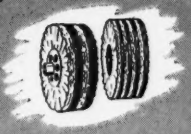

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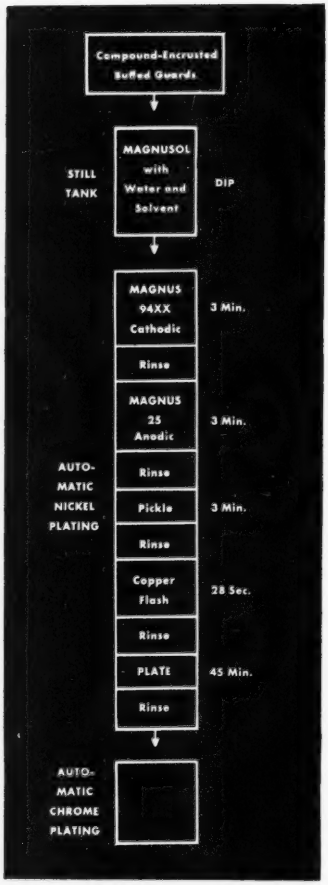

Magnusol Precleaning Stops Reject Troubles in Plating Steel Bumper Guards...

These stamped guards had to come from the bright nickel ready for chrome plating without buffing. But under former methods nearly 60% of the bright-nickeled guards either had to be color-buffed or scrapped because of peeling.

Former Method

Guards were spray washed in an alkaline cleaner, then cathodically and anodically cleaned, pickled, copper flashed, nickel plated in an automatic machine, and finally chrome plated.

Magnus Method

Guards are first precleaned by dipping in Magnusol-solvent-water solution at 140°F. instead of spray washing. They then go into the automatic bright nickel plating machine, but Magnus 94XX and Magnus 25, respectively, are used for cathodic and anodic cleaning. The only other change was to increase the copper flash from 10 to 28 seconds.

Results

Scrapping of guards has been virtually eliminated. Color-buffing is required on only a negligible part of the work. Precleaning removes the stubborn dirt that caused all the trouble, and keeps automatic machines free of contamination. Cathodic and anodic cleaning is more dependable, and of materially improved quality.

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In Finishing Production . . . the Future Belongs To Men Who *Plan* For It!

Barrel Finishing of Metal Products

Part 22—A Further Discussion of the Use of Minerals in Barrel Finishing Processes

By H. LEROY BEAVER
Barrel Finishing Consultant
Lansdale, Pennsylvania

IF any of our readers who have followed this series of discussions and who are interested in the various phases of the barrel finishing of metal products could put themselves in position to look over our shoulder and read the letters that come in to us in any average week, they would really marvel, as we constantly do, at the wide range of interest building up in this phase of the surface treatment of metals.

It can be hardly more than about five years ago that the barrel finishing of metal products in barrels using fragmented minerals as the surface removing medium was revived, but interest in this phase of finishing has mounted to a considerable degree. Now as we have often said, there is nothing new, as we see it, in any of these forms of the application of minerals to barrel finishing. From our investigation of prior uses in the field of barrel finishing we would refer anyone claiming mineral burnishing as original to the period from 1880 to 1885 when Edmunds in England was conducting his experiments with the use of various minerals and combinations of minerals. This was prior to his adoption of reject steel balls as a more durable and heavier material, and this series of experiments ran over a period from 1886 to 1900, because it was not until 1901 that the first of the Edmunds Barrels with their complement of steel balls was imported into this country. Steel ball burnishing as it is commonly termed really had its beginning at that time.

This is not to say that barrel finishing procedures were not used in this country until that time, because there were many applications wherein almost the whole gamut of minerals was sought to be used and in almost every conceivable form. We suppose that in the New England area in particular just about everything that could be put into a barrel was tried by some one or other at some time or place. Anyone studying the development of barrel finishing could not help but appreciate that as a method and a means for the treatment of metals, New England was using it for a great many years before it spread out over a very wide expanse of territory. Not only did the process spread, but barrel

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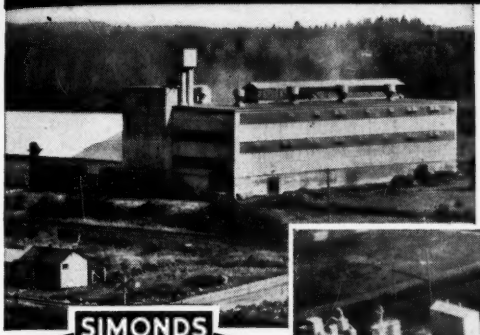

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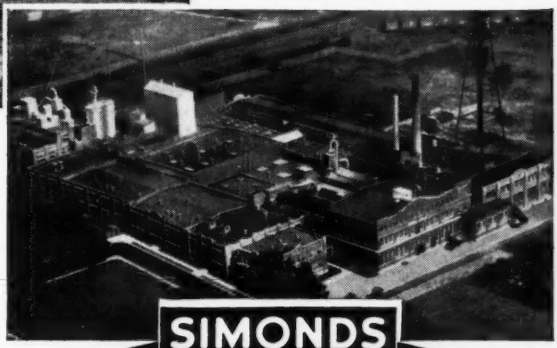

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operators spread as well. If, irrespective of the part of the country in which you live, you should chance to hear a barrel operator speak of the barrel finishing process as "rolling," you can be reasonably safe in asking just what part of New England he migrated from, for that is the generally accepted term applied to all barrel operations. And for the same reason if you should speak of a barrel finishing operation as either barreling or burnishing, they will be as prompt to let you know that you hail from somewhere other than New England.

Well, the gist of the correspondence we have been receiving of late seems to ask one general question and that is, "What is the most readily available and most reasonably priced mineral material available for use in barrels?" That seems like a fairly simple question on first glance, but on second glance it resolves itself into a series of unanswerables, because for the most part we are not familiar with the geological formations of the particular areas from which the inquiries come. We've been called a good many things down through the course of these discussions, some of them not too complimentary, but no one has ever tried to tag us with the title of geologist.

In order to provide some information on the various native minerals, or rocks, we will have to do some delving into petrology.

Petrology is simply the science of rocks, the branch of geology that is concerned with the investigation of the composite structure and history of the rock masses which make up the accessible portions of the earth's crust.

Rocks, speaking broadly, have been defined very simply as "aggregates of minerals," sometimes being found in such abundance of a given variety that whole districts, counties and we might almost say states are composed largely of one form, the granites of Vermont and New Hampshire. Then there are sandstone, limestone and slate, and even such unconsolidated material as sand, gravel, clay and soil, which are justly included among rocks because they are in large part the finer particles that have been ground down by nature through the ages from larger sizes, but they have the same constituents as the larger forms. Nearly all rocks consist of minerals, either in a crystalline or non-crystalline state. The insoluble parts of skeletons of animals and plants may form a major constituent of the rock mass in the case of coral limestone, lignite or chalk. A material that has a wide use as a metal polishing agent is found in the variously termed nieselguhr, or diatomaceous earth or infusorial earth. This material consists of the fossil remains of sea diatoms which are found in some deposits almost unbelievebly great, such as those in California owned by the Johns-Manville Company which serve as the source of

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For use where baking *cannot* be employed. Porous castings, wood, or other surfaces.

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For touch-up and repair of baked surfaces, or where no baking facilities are available.

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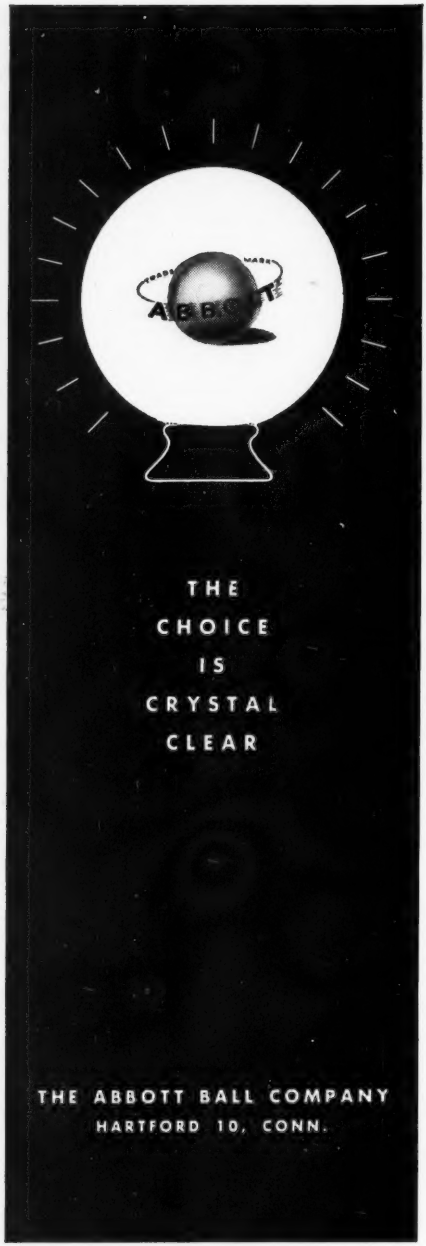

the product Celite. Used for the most part as a filter medium it nevertheless has far reaching values as a medium for use in the barrel finishing of metal products.

Generally speaking rocks are divided into three classes: igneous, sedimentary and metamorphic. Within these three classifications you will find all of the so-called "rocks" that might be applicable in barrel finishing procedure. These include sand, sandstone, quartzite, gravel, pumice, clay, firebrick, shale, slate, chalk, limestone, gneisses, and schists (for example, mica-schist or granite). You may recall that only a couple of months ago we discussed Danish and French Pebbles, the latter being simply flint nodules that are found imbedded in a chalk deposit which accounts for chalk being present in their analysis.

Only the most common of minerals are important as rock formers. Their number is comparatively small. By far the vast majority of the rocks that we see lying all about us consist of quartz, feldspar, mica, chlorite, kaolin, calcite and a few other minerals. Calcite, which is quite widely used, is most common in limestones, and is essentially carbonate of lime. Quartz is found in sandstones and in other igneous rocks containing high percentages of silica. Whatever may be the composition of the various rocks applicable to barrel finishing they all have certain distinguishing features that disclose their compositions.

All barrel operators and owners who have followed these discussions will recall the stress we have always placed on the relation of the specific gravity of the metal parts to be finished to the finishing material itself. The specific gravity range of any of the minerals (rocks) applicable to barrel finishing procedure will be between the figures of 2.5 to 3.2. The minerals will average about three times the bulk of steel materials or in other words, a bushel

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3. Houghto-Clean 220, being an emulsified solvent, is attracted to water in the spray rinse, and hence is more thoroughly removed than is a straight solvent.

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of average minerals or rocks will run from 85 to 115 pounds, while a bushel of steel materials will average almost an even 400 pounds. This relationship should always be considered.

Our own conclusion is that for the most part the barrels offered for use with minerals or rock materials are too small because they seem to be based on sizes previously used with steel materials. If the available barrels were larger and designed to accommodate a larger and heavier load of finishing materials the increase in the load pressure factor would aid materially in reducing the length of the operating cycle for each load of work. In answer to this we are invited to consider the increased cost of larger barrels, but as we see the problem, costs are only relative. If a larger barrel with a heavier load will appreciably lower production time per load, it will require only a very short time to absorb the difference in equipment cost through decrease in production cost to say nothing of the production volume.

In the case of ball or pebble mills used for the grinding of pigments and the pulverizing of various materials, the factor of weight as it relates to production has been studied for many years and the ratios are carefully and scientifically developed. There is little difference in the underlying factors involved whether we are seeking to pulverize materials by the use of harder minerals, or whether we are attempting to create one or more changes in the surfaces of the metals on which we operate.

It has been a rather significant thing to note that of all of the inquiries covering the various minerals to be used in barrel finishing, no one letter has asked any question regarding the "compounds" that are recommended for use with either the pebble formed or roughly fragmented materials, and yet it must be that herein lies the

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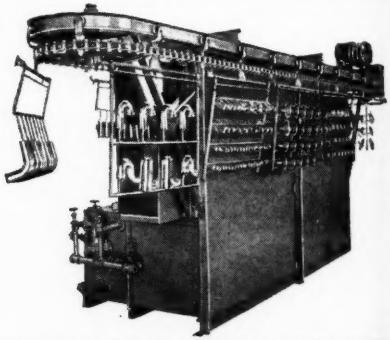

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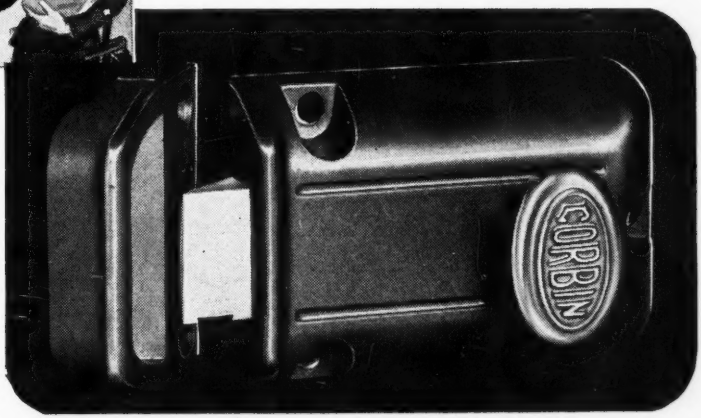

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greater part of the success of the undertaking. It is true of course that many barrel operations are performed with no other materials than sharp bank sand and water. Others are carried through with some form of oil combined with an abrasive, which we do not recommend. Still other barrel operations employ "suspending" material; namely, a material sufficiently viscous to hold in suspension abrasives and/or chemicals designed to produce given and desired results. Of course you could load a barrel simply with gravel, metal parts and water, but the final result would be a lot different than it would be if a more adequate process, using suitable abrasives held in suspension and continuously present between the finishing material and the parts to be finished, was used. We have seen a number of these compounds but we have never made a "break-down" analysis of any of them.

We predict that experience in the use of minerals for barrel finishing operations will result in changes and improvements both in materials and operating techniques. There are cases where a complete operation can be accomplished through the use of minerals. In other cases only one operation can be performed, and the final burnished surface must be produced by the conventional barrel finishing process wherein polished steel materials with soap lubricant are used.

Of course many things are being tried in the form of what we like to term "research" and which reduced to its simplest definition is just to try and try again in the hope that something will come of the effort. Of course, mistakes will be made, and there will be chaff mixed in with the grain. Perhaps we could best express what we mean by citing the verse of a poem of which we have been continually reminded through the years.

"Nothing useless is, or low,
Each thing in its place is best,
And what seems but idle show,
Strengthens and supports the rest."

It is that way with research. Whatever is advocated stands a chance of being adopted by someone, and, through the system of trial and error, the really worthwhile grain is separated from the chaff. That which proves its own worth in actual production is adopted.

Since our main interest is in the barrel finishing of metal products we favor a fair trial for everything that any fellow experimenter feels has merit for it is only in this way that we can progress to the end that barrel finishing treatment of the surface of metals reaches its highest peak of understanding. We feel and always have felt that it is not within our province in our barrel finishing research work to either praise or condemn an instrumentality, a material, or a process. Each must stand or fall on its own record of performance.

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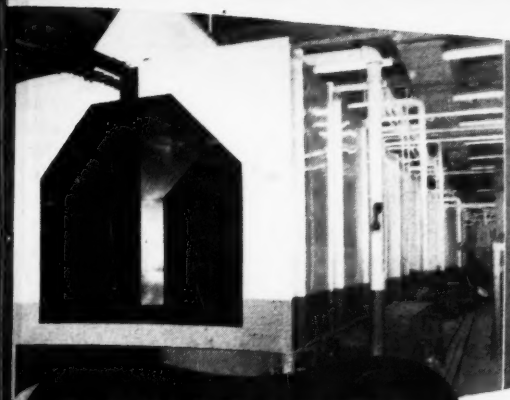

SHOWN AT LEFT IS AN END VIEW OF A LARGE BONDERITE MACHINE FOR AUTOMOBILE BODIES . . . PART OF A COMPLETE SYSTEM IN A NEW BRANCH PLANT.

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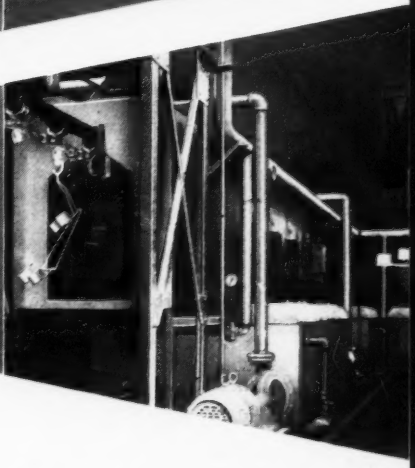

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Automatic Buffing Machine Speeds Finishing Operations

OVER a hundred malted milk containers can be polished in an hour on a semi-automatic rotary buffing machine recently designed by the Square Deal Machine Co., South Gate, Calif., for the Western Die Casting Company of Emeryville. The machine has been so designed as to be able to buff any cylindrical object from a tiny fountain pen to an eight-quart size cooking utensil. Production varies from 120 to 2,000 pieces per hour, according to the object to be polished and buffed.

For the malted milk containers, the machine has a rotating work table powered by a 1 h.p. G-E motor. Eight collets are mounted on the table, six of which are used for the buffing operations and two for the loading and unloading action. The table has been set to index every 20 seconds; i. e., 12 seconds buffing time plus 8 seconds travel time from one head to another.

The six buffing heads are separately controlled and driven by individual G-E tri-clad, general purpose, squirrel cage, 1,800 r.p.m. motors. Four are 3 h.p. and two are 7½ h.p. The collets, rotated by a ½ h.p. G-E gear motor on the rotating table, are positioned under the buffing wheels through an index cam arrangement so that the work goes through the required polishing time cycle under each wheel.

The first two stations are driven by 7½ h.p. G-E motors driving a sizalin sewed buff. The first one provides a 4-inch wide buff covering the side of the work, and the second covers the top and bottom radii. A heavy coating compound is applied for this buffing operation. Stations 3 and 4 are driven by 3 h.p. G.E. motors driving cotton

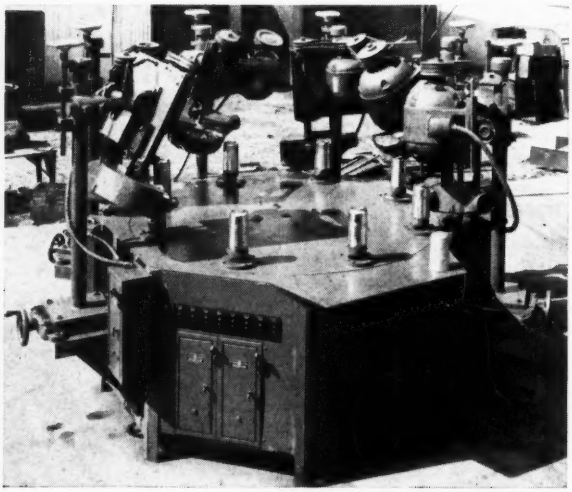

Illustration shows semi-automatic rotary buffing machine tooled for production of malted milk containers. *(Photo courtesy General Electric Co., Schenectady 5, N. Y.)*

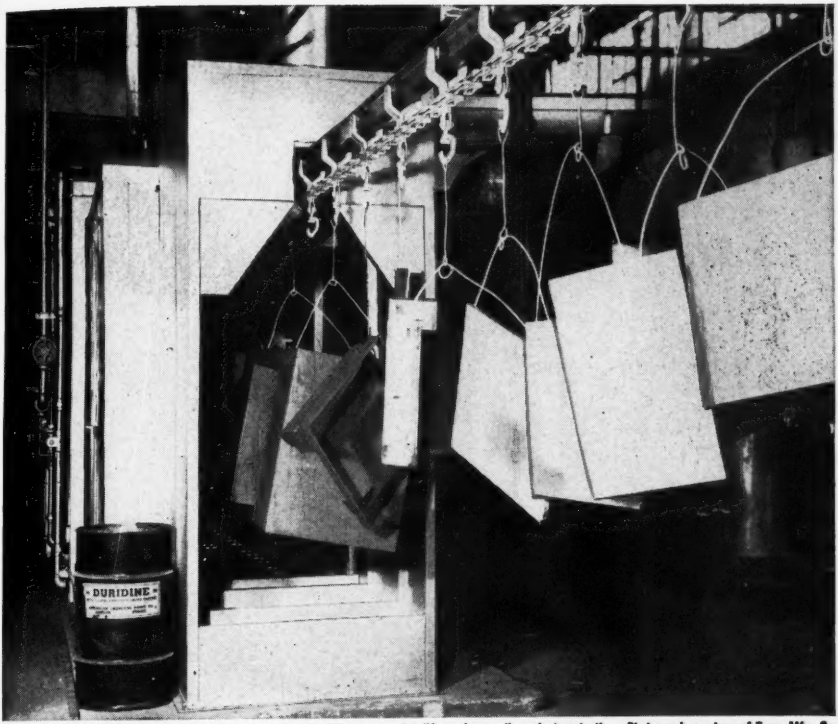

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Fig. 1 — A group of chromium plated magnesium die castings
(Photo courtesy The Dow Chemical Co., Midland, Mich.)

sewed buffs which use the same cutting compound as the first two stations. However, less pressure is applied and a semi-finish is given to the work. At Station 3 the side is buffed, and at Station 4 the top and bottom are processed. At Stations 5 and 6 a cotton sewed material buffing wheel is used but even less pressure is applied. A coloring and cleaning compound is used at these stations for the finishing operations. The side is buffed at Station 5 and the top and bottom radii at Station 6.

Spring loaded flexible buffing heads with hydraulic stabilizers are important features of the machine which provide for the uniformity of polishing action and the flexibility necessary for the automatic polishing and buffing of a wide variety of metal parts.

Dow Process for Plating on Magnesium

THE development of the simple, yet specialized, technique required for the nickel and chromium plating of zinc base die castings and aluminum products was once regarded as a triumph of the platers' art. However, this technique has now become a quite commonplace operation, since these "active" metals and their alloys have been plated commercially for several years.

The formation of metallic coatings on magnesium by electrodeposition, long regarded as impossible or impractical, can now be accomplished through the use of a process recently developed by The Dow Chemical Company, Midland, Michigan. The heart of the Dow process involves the deposition of a thin film of zinc on the magnesium, over which other metals may be plated in the conventional manner. From a production standpoint, the process had advanced to the "semi-plant" stage and has been used for plating 40,000 die cast magnesium parts. Results obtained over the past year indicate that from a performance standpoint the coatings formed on magnesium are satisfactory. Several magnesium products which have been plated are illustrated in Fig. 1.

Processing cycles for electroplating most metals prescribe only the process to be followed after polishing or buffing. For magnesium, treatment prior to buffing or polishing is prescribed. Wrought products should be pickled in 20 per cent acetic acid containing 5 per cent sodium nitrate to remove surface contaminations and

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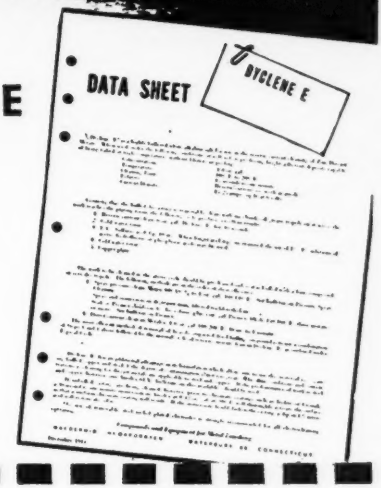

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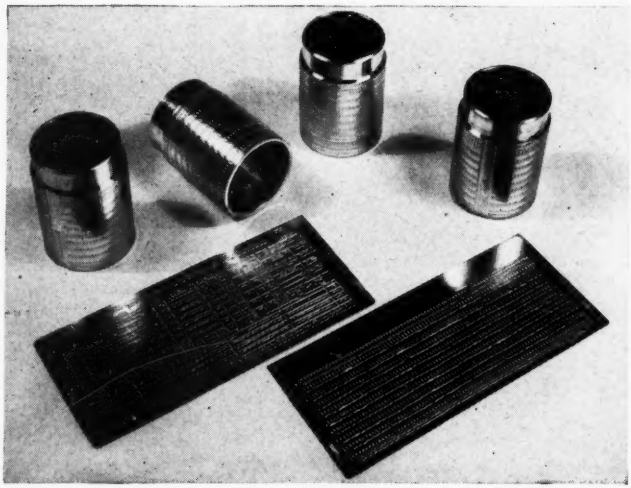

Fig. 2 — Chromium plated magnesium printing plates and cylinders (*Photo courtesy The Dow Chemical Co., Midland, Mich.*)

prevent their being driven into the surface during the buffing or polishing operation. Cast products should be pickled in a 75 to 80 per cent phosphoric acid solution prior to polishing or buffing to remove surface segregate of intermetallic compounds.

Magnesium parts can be degreased by conventional vapor or immersion methods and then cathodically electrocleaned in alkaline cleaners such as are used on steel to remove oils, greases, or buffing compounds. To activate the surface, pure magnesium or M alloy is then given a 15-second to one-minute mild pickle in a 1 per cent acetic acid solution. Because of a smut which forms on the alumiuum or zinc-containing magnesium alloys immersed in acetic acid solutions, these are pickled for the same length of time in 20 per cent aluminum chloride. A variation of the usual practice is used on photoengraving plates since no etching of the engraved points is permissible. The plate is first cleaned in 20 per cent chromic acid to remove contamination, then in a 15 per cent hyroflouric acid solution to completely remove all chromium compounds, and finally activated in the alumium chloride etch.

After metal surface activation, an adherent thin zinc film is deposited on the magnesium surface by simple immersion in a bath containing:

12 per cent tetrasodium pyrophosphate.

4 per cent zinc sulfate.

1 per cent potassium fluoride.

0.5 per cent potassium carbonate.

The bath is operated at 170 to 180 deg. F. with a pH of 10.2 to 10.4. The M alloy is immersed in the bath with agitation for 3 minutes, and the alumium containing alloy for 5 minutes. The tank and heating coil should be constructed of stainless steel and the water used to make up the solution should be free from iron.

After removal from the zinc immersion bath and rinsing, copper is deposited on the magnesium from a typical Rochelle salt copper plating bath for two to three minutes at 5 amp. per sq. ft. and then for three to eight minutes at 15 to 20 amp. per sq. ft. The copper deposit may be further built up in this strike bath to a thickness of 0.0003-0.0005 inch or transferred to commercial bright high speed copper baths. Nickel may be deposited over these copper deposits from any of the proprietary bright nickel baths or from the Watts bath. If desired, any of the commercially

Dolan's "Big-4"

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Synthe-Chrome- A clear water white baking synthetic which provides the closest reproduction of chrome plating on highly buffed white metal die castings. Exceptionally desirable because of Chromic Acid shortage.

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1016-Black Metal Lacquer- Outstanding quality designed for use on Instrument Panels, Control Cases, Switch Boxes, etc.

No. 4

855-Water-Dip Clear- A synthetic protective coating which prevents oxidation and finger printing of all plated surfaces. Instantaneous dry.

For detailed information write today—

V. J. Dolan & Co., Inc.

Manufacturers of

"Unquestionable Quality" INDUSTRIAL FINISHES

1830 N. Laramie Ave. Chicago 39, Ill.

Berkshire 0100

plated metals such as chromium, silver, gold, and so on, may be deposited. If brass, cadmium, or zinc is the desired finish, the copper strike may be omitted and the finish applied directly to the zinc immersion deposit.

Physical tests performed on the plated coating indicate that it compares favorably with other electroplates. Good adhesion is obtained. Parts may be hammered or severely rubbed without lifting the deposit. As much as 0.0005 inch of chromium has been applied without causing lifting or flaking. A sample of nickel plated magnesium was heated over a Bunsen burner until the magnesium began to melt, yet no blistering of the plate occurred.

During the past year, exposure tests of various types have been in progress and indicate that plated coatings on magnesium have good resistance to corrosion. Wrought and die cast magnesium parts, some plated with silver and others with nickel and chromium, are still in perfect condition after exposure for more than two months to an 85 per cent humidity atmosphere at 95 deg. F. Other parts resisted initial breakdown in 20 per cent salt spray for 70 to 195 hours. Parts exposed to outdoor industrial atmospheres for the past year are still in good condition.

On the basis of test results to date, the industrial designer is justified in using magnesium for many applications where its physical properties and fabrication characteristics can be utilized to advantage. In addition to the many household equipment and automotive parts that may be fabricated from magnesium, the use of this metal in the manufacture of photograving and printing plates, as illustrated in Fig. 2, seems to hold much promise. This application has more than the usual interest because it serves as a reminder of the wide publicity given chromium plating as a result of Mr.

Industry's 3 Newest

COLD STRIPPERS

Fast! Economical! Safe! New!

"UNISOL No. 1"—For removing all baked enamels! Used cold—Non inflammable—Non toxic—Strips baked enamels in seconds—Used for all type metals—Requires no rinse—Non injurious to hands or clothing.

"UNISOL No. 2"—A new cold stripper for japans and vinyls—Non inflammable—Strips tough japans and vinyls in matter of minutes—Used for all type metals.

"STRIPPER 202"—Something new for removing "stop-off" lacquers in seconds—Will not tarnish highly polished metal surfaces—Non inflammable—Used cold—Non toxic.

Samples and further information supplied on request.

CHEMCO PRODUCTS CO., Inc.

1059 EAST 76TH STREET • CHICAGO 19, ILLINOIS

A user of Eclipse Air Spray Equipment paints 225 cans with the same 5 gallons of paint that previously covered only 125 cans.

UP TO 75% LESS WASTED PAINT*

*Case History Available

IN PRODUCTS FINISHING OR MAINTENANCE

ECLIPSE LOW PRESSURE PAINT SPRAY EQUIPMENT by using lowest possible air pressure and volume, consistent with good results, reduces offspray and fumes.

The result: More complete coverage in one pass of the spray gun—decreased paint waste.

OTHER ADVANTAGES—

- **Uses less power**
- **Reduces fire hazards**
- **Increases operation speed**
- **Smoother finishes, higher gloss**
- **Better flow, penetration, adhesion**
- **Greater durability**
- **Less sanding and rubbing**

You'll like the rugged simplicity of *Eclipse Low Pressure Spray Equipment* and its service.

Send for our complete catalogue

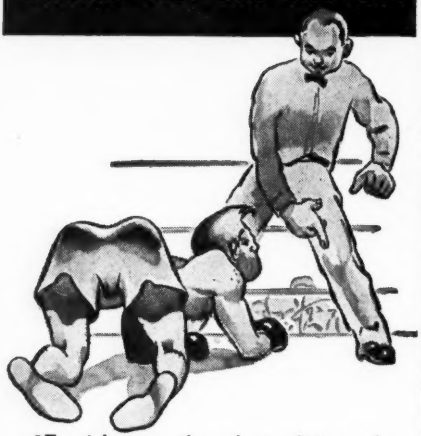
Write: **ECLIPSE AIR BRUSH COMPANY, INC.**
Park Ave. & 14th St., Newark 7, N. J.

Spray Equipment Division

ECLIPSE

Manufacturers of Low Pressure Spray Equipment Since 1908

The DUST-ALL
TACK RAG
Collects Dust and Dirt Too!



IT picks up the dust, dirt and specks that spoil paint jobs. It assures a pride-arousing finish job and a profitable one. Get them from your dealer or write us.

The Dust-All Tack Rag comes in the characteristic *Red Checkered Bag.*

HARDING
MANUFACTURING CO.
10614 Gratiot Ave., Detroit 13, Mich.

C. T. Thomas' work on the chromium plating of the steel plates used to print paper money over 20 years ago. Magnesium photoengraving plates, of interest to photoengravers because of magnesium's speed of etching, have withstood 500,000 impressions in one instance cited. Similar parts plated with 0.0002 to 0.0003 inch of chromium have been reported in good condition after 6,000,000 impressions.

The fact that magnesium or any of its commercial alloys may now be plated with various metals in the conventional manner will no doubt stimulate designers, fabricators, and processors to discover many other uses for this modern metal. The process described here is available from The Dow Chemical Company under license agreement.

Acid Resisting Enamel Range Tops Produced with One Coat of Porcelain Enamel

TITANIUM steel—a super metal that scientists are now seeking in a pure form to meet the extreme heats generated by jet plane engines—is in limited use on the range tops of the 1948 line of Westinghouse electric ranges, according to R. M. Beatty, manager of the electric range department of the Westinghouse Electric Appliance Division. The new steel, which uses a single coat of a special porcelain enamel for its thin, tough, acid resistant, white finish, was developed by the Inland Steel Company, and it was tested by Westinghouse for its use on the production line. The joint project was started after V-J Day and the first test production run was made in mid-summer of 1946.

The titanium steel is a basic open hearth steel which contains enough titanium to combine with the carbon in steel, reducing to a negligible point

SAVE ON WHEELS . . . STEP UP PRODUCTION

Speeds from 1,500 to 3,000 RPM are instantly available with the turn of the dial while the lathe is in operation. Polishing and buffing (cut-color-satin) can be done on one machine with no delays or lost motion.

The Hammond VRO Variable Speed Polishing Lathe definitely will step up production and improve finish. Maximum wheel economy is assured, too, because efficient peripheral speed can be maintained at all times — wheels can be used right down to the flanges before discarding.

PROMPT SHIPMENT!

Hammond

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VARIABLE SPEED
POLISHING
AND
BUFFING
LATHE

the DIAL does it

WRITE FOR CATALOG! Catalog showing all Hammond polishing lathes, abrasive belt, "OD" and automatic finishing machinery gladly sent on request. Write today!

See Hammond Equipment In Operation At Booths 142-143-144 At The Industrial Finishing Exposition, Atlantic City, June 28-July 1.

Hammond of KALAMAZOO
GOOD MACHINERY SINCE '82

Hammond Machinery Builders INC.

1622 DOUGLAS AVENUE • KALAMAZOO 54, MICHIGAN

the high temperature effects of carbon in steel, such as sagging. Steel "sag" is the buckling effect of the metal, sometimes experienced under enameling furnace heats of 1,500 to 1,700 deg. Fahrenheit. The titanium steel contains about 0.5 per cent of the rare metal.

Under current porcelain enameling processes, using vitreous enameling steels, the steel receives three coats—a ground coat, the porcelain enamel finish coat, and an acid resistant coat. However, with titanium steel, the single coat of titanium porcelain enamel provides an attractive acid-resisting surface for Westinghouse electric range tops.

Vanott V-8 Buffing and Polishing Machine, an eight-spindle automatic electrically powered unit said to be capable of finishing up to 800 parts an hour, is illustrated and described in a four-page two-color folder published by the Vanott Machine Corp., 222 Colgate Ave., Buffalo 20, N. Y. Illustrations of typical examples of the variety of shapes which can be handled by the machine are included. Copy free upon request.

Klene-ezy Bulletin. An attractive bulletin describing the Klene-ezy Parts Cleaning Machine has been published by the Cincinnati Cleaning and Finishing Machinery Co., Ironton, Ohio. The literature describes fully the Klene-ezy method of cleaning parts in metal-working plants and repair shops. Copy free.

"Aspects of Galvanic Corrosion" is the title of a ten-page booklet issued by The International Nickel Co., Inc., 67 Wall St., New York 5, N. Y. The booklet contains a brief history of the discovery of galvanic action, lists a series of metals and alloys arranged in order of their susceptability to corrosion, and outlines some of the factors influencing galvanic corrosion together with information showing how galvanic effects can be minimized. Copy free upon request.

A *NEW* PROTECTION FOR METALS

● Striplastic is a protective plastic applied by spraying, dipping or rolling. It is used on stainless steels, high polished metal sheets, sheets in cold working or drawing, tools, dies and parts, and on sheets or metal parts before packaging. It protects against scratching and abrasion, and against rust.

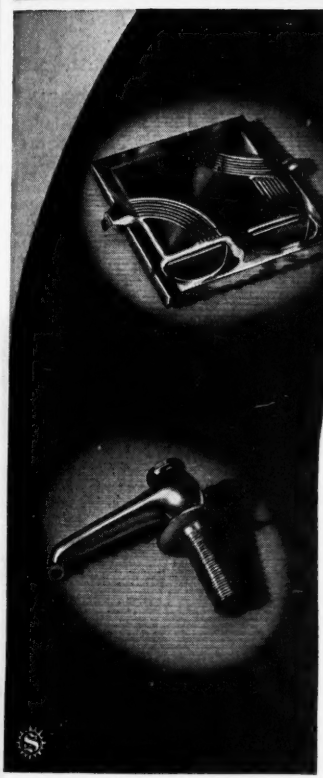
Among many advantages, it is non-toxic, possesses great tensile strength and is easily stripped off in one piece.

Write for complete information on this new strippable plastic.

THE STRIPLASTIC COMPANY

10828 QUEBEC AVENUE • CLEVELAND 6, OHIO

CUT FINISHING COSTS with



SEYMOUR BRIGHT NICKEL PROCESSES

Added to standard Watts or high chloride baths, any one of the three Seymour Bright Nickel Processes, "C", "NC", or "CK", will effect substantial savings.

Deposited nickel plate requires no further finishing before chromium plating and chrome deposits more easily over bright nickel than over buffed nickel. Base metals, except zinc base alloys, having an acceptable finish may be bright nickel plated *directly*.

Due to its operation at a pH to 4.5 Electrometric, Seymour Bright Nickel has excellent throwing power with perfect adherence to properly cleaned base metals even with very thin deposits. Write for complete details.

THE SEYMOUR MANUFACTURING CO., SEYMOUR, CONN.

Nonferrous Alloys Since 1878

SEYMOUR

NEWS of the Industry

New Plant Increases Cowles Manufacturing Facilities

The Cowles Detergent Co., Cleveland, Ohio, has announced the completion of a new million dollar plant at Skaneateles Falls, New York. One of the most modern chemical plants in the country, it is equipped with up-to-date technological equipment for the manufacture, packaging, and shipping of the Cowles line of heavy chemical silicates as well as the company's line of specialized detergents for the commercial laundry, metal cleaning, food sanitation and other fields.

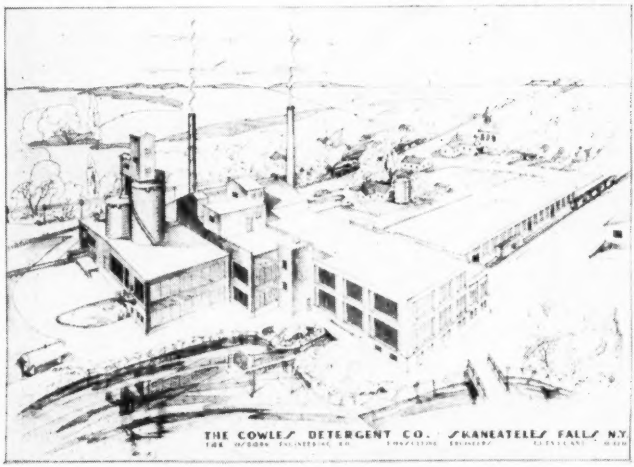
The company's plants at Lockport, New York, and Sewaren, New Jersey, are operating at capacity. The addition of the new plant at Skaneateles Falls, where operations have already commenced, will make it possible for the company to expand production to the point where deliveries can be effected more promptly and in increased quantities. It will also enable Cowles to expand sales in the industries now served as well as reach new markets not previously touched.

G. Klinkenstein Elected President of Maas & Waldstein Company

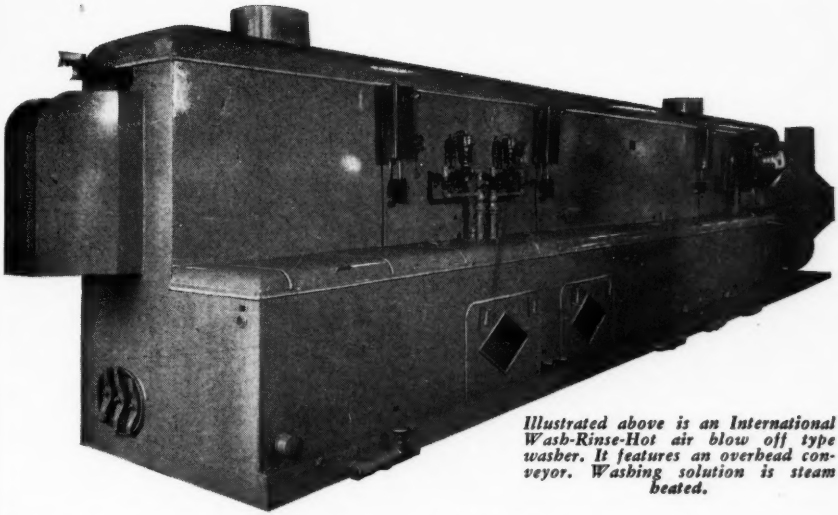
The board of directors of the Maas & Waldstein Co., Newark 4, N. J., has announced that G. Klinkenstein, formerly vice president and general manager of the company, has been elected president.

Mr. Klinkenstein has been with the company since 1915, starting as a chemist in the nitrocellulose plant. In 1922 he became chief chemist of the company and in 1928 was advanced to technical director. Mr. Klinkenstein was elected vice president and general manager in 1936. Under his supervision, and also as a result of his own research, the number of Maas & Waldstein Company products expanded from just a few clear metal lacquers to a complete line of industrial finishes.

Mr. Klinkenstein is a member of the American Chemical Society, the Newark Athletic Club, and is currently completing a term of office as 1947-48 president of the New York Paint, Varnish and Lacquer Association.



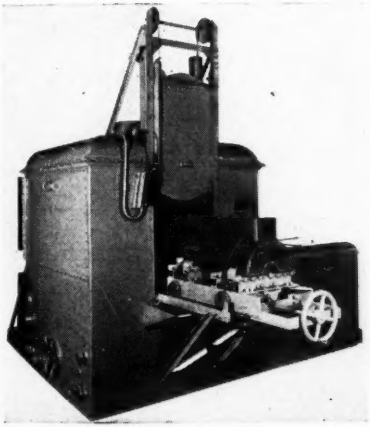
New Cowles Detergent Company Plant at Skaneateles Falls, New York



Illustrated above is an International Wash-Rinse-Hot air blow off type washer. It features an overhead conveyor. Washing solution is steam heated.

INTERNATIONAL BUILDS INDUSTRIAL WASHERS

For Every Type of Business!



International Cylinder Block Precision Type Washer. Equipped with timing device to insure correct elapsed time for washing and rinsing.

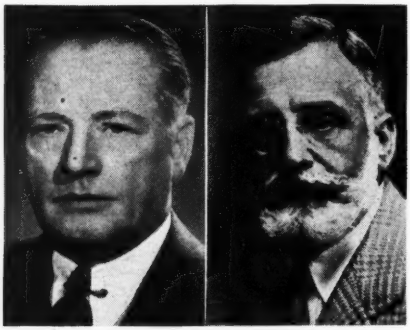
Efficient design coupled with the excellent construction features embodied in International Washers make them outstanding, dependable and profitable production units. Among the features are rugged pressure pump; removable dirt catching screens for quick, easy cleaning; solution tank storage capacity from 2 to 3 times volume pumped per minute; full range of conveyors; choice of corrosion resistant spray nozzles — from mist to open stream; proper location of nozzles; welded fittings for all water, steam or gas and drain connections. Also specialize in building Bonderite Units.

Write for folder. Recommendations and quotations promptly supplied.

INTERNATIONAL CONVEYOR & WASHER CORP.
652 E. FORT STREET • DETROIT 26, MICHIGAN

H-VW-M Company Appointments

The Hanson-Van Winkle-Munning Co., Matawan, N. J., has announced the appointment of officers at the annual directors' meeting held at Matawan, New



Louis M. Hague (left), Van Winkle Todd

Jersey. The following changes were announced: Van Winkle Todd, who previously served as president, was appointed chairman of the board of directors; Guerin Todd, former vice president, was appointed vice chairman of the board; Louis M. Hague, former vice president, was appointed president; and John A. Bauer, former sales manager, was appointed a vice president, assuming many of the duties for which Mr. Hague was previously responsible. All of these officers have been with the company 20 years or more,

Van Winkle Todd became associated with the Hanson & Van Winkle Company in 1912 and was its president at the time of its consolidation with A. P. Munning & Company in 1927, to form the Hanson-Van Winkle-Munning Company. Mr. Todd has served as president of H-VW-M since that time. He will continue to maintain an active participation in the affairs of the company.

Louis M. Hague, the new president, became familiar with the electroplating industry at an early age in Pittsburgh where both his grandfather and his father operated electroplating plants. He joined the staff of the Hanson-Van Winkle-Munning Company in 1928, and has served in various sales and service capacities. Since 1939 he has been a director of the company and vice president in charge of sales.

Sales Representative Named by Pennsalt Special Chemicals Division

Appointment of William D. Wilson as district sales representative in Northern New Jersey and New York City for the Special Chemicals Division of the Pennsylvania Salt Manufacturing Company, Philadelphia 7, Pa., has been announced by Joseph J. Duffy, Jr., manager of sales.

Mr. Wilson, before joining Pennsalt last January, was a chemist with the McCormick Rubber Company, Ridgefield Park, New Jersey, for 11 years and with Curtis-Wright, Caldwell, New Jersey, for six years. Mr. Wilson is a graduate of Pratt Institute, Brooklyn, New York, and is a member of the American Electroplaters' Society.

Vice Presidents Elected

The Minnesota Mining & Manufacturing Co., St. Paul, Minn., has announced the election of J. C. Duke as vice president in charge of the "3M" coated abrasives division, and J. A. Borden as vice president in charge of the "Scotch" tape division of the company.

Mr. Duke joined the firm in 1921 and

J. C. Duke (left), J. A. Borden

has served as sales manager for the company's surface-coated abrasive paper and cloth, including products for metalworking and wood-working industries.

Mr. Borden joined Minnesota Mining in 1925 and for the past 7 years has been sales manager for Scotch tapes for packaging, masking, sealing, decorating, and sandblasting.

You can produce on any material the following surface finishes:

FELT - SUEDE LEATHER - MOHAIR VELOUR - VELVET - CARPET

FUNCTIONAL USES

Used in the auto, airplane, radio, electrical, phonograph, ceramics, furniture and many other industries for surfacing all sorts of materials to provide

TEMPERATURE INSULATION • SOUND DEADENING • INTEGRAL GASKETS • SHOCK ABSORBING SURFACE • NON-MAR SURFACE • NON-GLARE SURFACE

DECORATIVE USES

Applied in various lengths and colors to wood, paper, cloth, metal, etc., the following effects are produced—

FURNITURE UPHOLSTERY • SUEDE LEATHER • INTERIOR AND DRAPERY FABRICS • VELVET • VELOUR • MOHAIR • CARPET

with these patented and trademarked Rayco specialties:

FELT AND SUEDE SURFACE

*"Raymix"—a flock of rayon fibres, trademarked under U. S. No. 427949 to produce a suede effect of utmost realism on any surface.

*"Kingcote"—a cotton flock trademarked under U. S. No. 423572, producing a suede effect at minimum cost.

MOHAIR, VELOUR AND VELVET SURFACE

"Raycote"—a flock composed of uniformly cut rayon fibres to produce on any surface a pile effect such as velvet, plush, or velour. Made under U. S. Patent No. 2014947.

SYNTHETIC CARPET

"Harecote"—a flock composed of animal fibres, produces a durable carpet or rug material.

Request Free Color Card of Actual Samples

**Rayon Processing Co. of R. I., Inc.*

**Registered Trademark*

PIONEER PRODUCERS OF SURFACE COATING FLOCKS

65 MOSHASSUCK STREET • PAWTUCKET, R. I.

POLLAK PAINT CO.
715 Main St.
Buffalo, N. Y.

LAMBERT-NEW ENGLAND CO.
79 Sudbury St.
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H. R. MEININGER CO.
409 16th St.
Denver, Colo.

J. GORDON SMITH CO.
3901 Main St.
Dallas, Texas

R. W. Helmig Elected Vice President and Director

At the annual board of directors meeting of The Electric Products Co., Cleveland, Ohio, manufacturer of electric equipment, R. W. Helmig was elected a vice president and director of the company.

R. W. Helmig

Mr. Helmig joined The Electric Products Company in December 1944. Prior to that time he had been associated with Delco Products Corporation, Commercial Investment Company, W. W. Sly Manufacturing Company, and had owned The Planefilm Corporation. He brings to his new position a broad background of experience in production and manufacturing methods.

Chicago Representative for Schneible Appointed

The Claude B. Schneible Co., 2827 Twenty-Fifth St., Detroit, Mich., manufacturer of dust and fume collection and disposal equipment, has announced that George C. Schreiber of the sales engineering department has been placed in charge of the Northern Illinois and Wisconsin territories with headquarters at 1809 West North Avenue, Chicago.

Mr. Schreiber brings to his new position a fine background of experience in the manufacture, installation, and operation of dust control equipment.

A.E.S. Plating Room Waste Purification Study

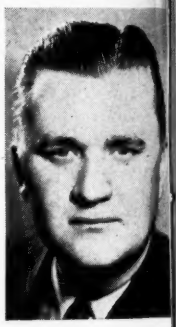
With the increase in the volume of industrial electroplating there is an ever increasing problem in the disposal of wastes. Most chemicals used in the industry have a tendency to pollute streams. Public appreciation of the value of clean streams, lakes, and ponds has resulted in legislation prescribing penalties for stream pollution.

One of the most poisonous of all plating room wastes is cyanide. This enters the stream in dilute wash water and occasionally as a strong solution. Even very minute concentrations of cyanide are sufficient to kill fish life. The industry is faced with a problem of destroying the cyanide in large volumes of waste water. The Research Committee of the A.E.S. has set up a project, under Dr. B. F. Dodge at Yale University, to study this problem. They seek to develop a method of purifying waste waters economically before discharging them into streams. Several alternate methods are actively under investigation in view of the fact that large plants may require different purification methods than small ones.

Following the cyanide study, other plating room poisonous waste problems will be investigated.

Burke Roche Named Vice President of Binks

Burke B. Roche has been elected vice president by the board of directors of the Binks Manufacturing Co., 3118 Carroll Ave., Chicago 12, Ill. Prior to his election as vice president, Mr. Roche was in charge of the Industrial Division of the company.

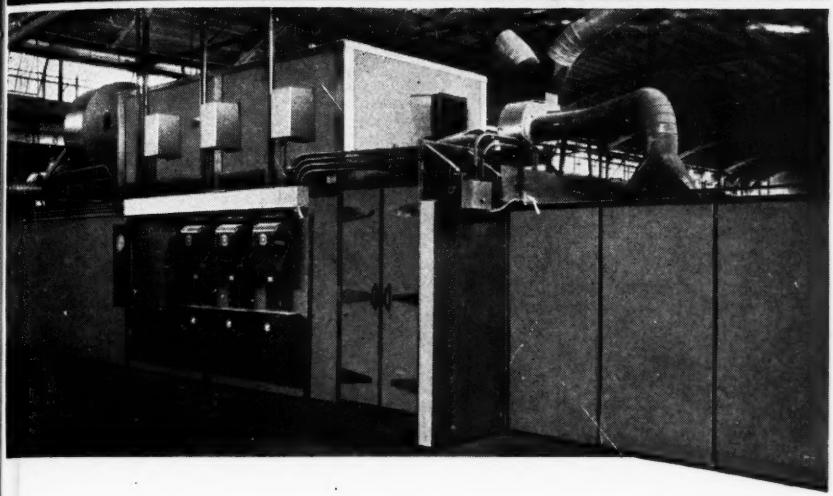


Burke B. Roche

Mr. Roche, who has been with the Binks organization since 1939, installed finishing equipment at the Kingsbury, Indiana Ordnance Works, one of the largest installations ever made. He later was graduated from the Naval Ordnance School at the Naval Gun Factory in Washington, D. C., and served as a Naval Ordnance Officer in the Pacific theatre of operations during the war.

Mr. Roche, after receiving a bachelor of philosophy degree from Loyola University in 1936, attended Northwestern and DePaul law schools. Receiving his degree from the latter in 1939, he was admitted to the Illinois bar in 1939.

KIRK AND BLUM "*Miracle*" OVEN HELPS PRODUCE "*Miracle Walls*"



DRYING TIME CUT 23½ HOURS

at **TYLAC COMPANY, MONTICELLO, ILL.**

Three other oven manufacturers said "it can't be done"! KIRK & BLUM Engineers said ***it could be done***—DID IT—and PROVED IT! Now, drying time has been reduced from 24 hours to 30 minutes. Wall board is dried horizontally rather than vertically to secure even distribution of finish.

Installation of this modern KIRK & BLUM Oven, plus automatic paint spraying and conveying equipment, has resulted in a 50% production increase in less than ½ the floor space . . . has enabled the manufacturer to hold prices at pre-war levels! Gain by KIRK & BLUM's 40 years of experience.

Write for catalog, "Industrial Ovens."

THE KIRK & BLUM MFG. COMPANY
2816 Spring Grove Ave.
Cincinnati 25, Ohio

KIRK AND BLUM
INDUSTRIAL OVENS

Craven and Taylor Promoted at Pemco

H. G. Wolfram, vice president in charge of manufacturing, Pemco Corp., Baltimore, Md., has announced the appointment of Henry E. Craven as manager of materials and processes and Sidney F. Taylor as superintendent of production.

Mr. Craven, a ceramic engineer graduate from North Carolina State College, joined Pemco in 1933. After serving in various manufacturing capacities, he was made assistant plant superintendent and in 1938 was appointed plant superintendent. He served in the chemical warfare division of the armed services from 1942 to 1946, at which time he returned to Pemco and his previous position. One of the chief responsibilities connected with Mr. Craven's new position will be the supervision of the control system of incoming and outgoing material at the Pemco plant.

Mr. Taylor, in his new position, will have complete charge of all production for the Pemco plant. Mr. Taylor came to Pemco in 1941 as a cost accountant. He served in the United States Air Forces from 1942 to 1946 and then returned to Pemco to do production cost analysis.

Electroplating and Metal Finishing Laboratory Planned

Joseph B. Kushner

Joseph B. Kushner, B.S., Ch.E., consulting electrochemist and metal finishing engineer, has completed plans for a new electroplating and metal finishing laboratory to be built at Stroudsburg, Pennsylvania within the next few months. The laboratory will be devoted to research and development work in electroplating, electroforming, and electrophoresis techniques. Mr. Kushner will continue to serve his Greater New York and New England clients from his New York consulting office, 223 W. 26th St., New York 1, New York.

Field Engineer Appointed

Chas. A. Oostdyk, Jr.

Appointment of Charles A. Oostdyk, Jr. as tank lining field engineer for the West Coast district of Goodyear Tire & Rubber Company's mechanical goods division has been announced by H. D. Foster, division manager.

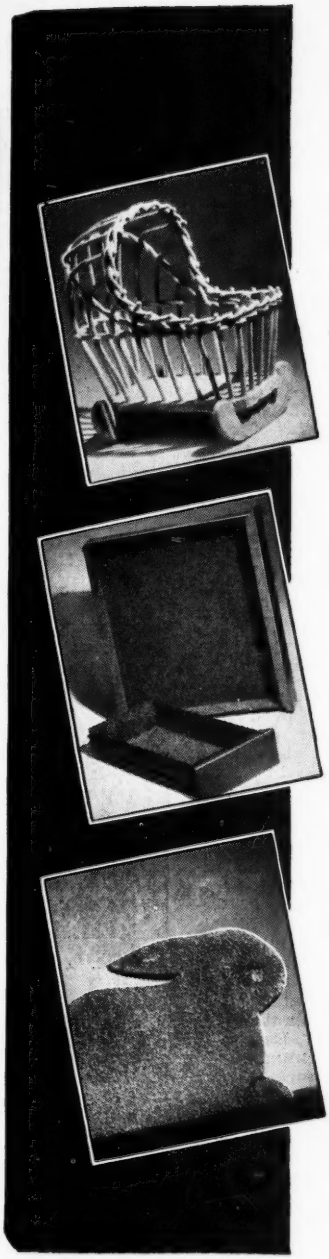
This is a new post in the company's West Coast district. Mr. Oostdyk will supplement the work of Goodyear engineers in Akron and Los Angeles, an supervise the installation of rubber-lined equipment. His headquarters will be in Los Angeles where he will be responsible to R. G. Abbott, Goodyear district manager.

A native of Detroit, Mr. Oostdyk studied mechanical engineering at the University of Michigan, and served three years overseas as a meteorologist with the Air Force.

A.S.T.M. 51st Annual Meeting

Featuring several extensive symposiums and numerous technical papers and reports, the 51st Annual Meeting of the American Society for Testing Materials will be held in Detroit throughout the week of June 21. Another feature of the meeting, which will be held concurrently with the Society's Eighth Exhibit of Testing Apparatus and Related Equipment, will be a photographic exhibit and competition on the theme "Materials—Testing and Research."

The exhibits will be on display at the Book-Cadillac Hotel which is the main registration headquarters, but there will be auxiliary headquarters at the Statler and Detroit-Leland, where committee meetings and some sessions will be held. Technical sessions will include a symposium on Metallography in Color, a symposium on Magnetic Testing, and a symposium on Speed of Testing. Other meetings and discussions will be concerned with various other phases of materials testing and the properties of materials used in various industrial operations.



For Jewel Box Beauty and New Sales Appeal . . .

"STYLON" Finishes

Here are three typical examples of product-betterment with Stylon finishes — the clever flower cradle with its baby-soft, velvety feel; the sound-cushioned, jewel-box lining of the metal trays; the furry, life-like surface of the toy rabbit. In every case a luxurious, cost-cutting finish of Stylon added rich, colorful beauty and exciting new sales appeal.

In the belief that new beauty and sales appeal will help sell your product better, we invite you to submit samples to our Product Engineering Department for free Stylonizing tests. Our new Stylon booklet, complete with 34 color swatches, tells the complete story. Write for your free copy today.

BEHR-MANNING · TROY, N. Y.

(DIVISION OF NORTON COMPANY)

QUALITY AND SERVICE SINCE 1872

Appointed Vice President of Egyptian Lacquer

O. J. S. deBrun, president of the Egyptian Lacquer Manufacturing Co., South Kearney, N. J., has announced the appointment of Hugh C. Crawford as vice president. Mr. Crawford has been with Egyptian since 1937, first as sales representative for the State of Connecticut, then as director of war production during the war years. In August 1945 he succeeded to the position of director of sales, and in his new capacity will continue to superintend the operation of the sales division.

Hugh C. Crawford

For the ten years prior to 1937 Mr. Crawford was purchasing agent for the Arrow, Hart & Hegeman Electric Company, Hartford, Conn.

J. F. Reed Manufacturing Corporation Formed

Joseph F. Reed, Jr. has announced the formation of a company to be known as The J. F. Reed Manufacturing Corporation, which will specialize in the design and manufacture of plating and heat treating racks and accessory equipment. Offices and plant are located at 286 Hamilton Street, New Haven, Connecticut.

The plant is thoroughly equipped and expertly staffed for the design and production of specialized plating racks, heat treating racks and holders — all engineered for specific applications.

Hercules Powder Company Student Tours

Hercules Powder Company has inaugurated a series of tours of several of its plants and laboratories for student chemists, chemical engineers, and their professors. The tours include the Hercules Experiment Station, the company's central research laboratories near Wilmington, Delaware; the Hopewell, Virginia cellulose products and chemical cotton plants; and the naval stores at Brunswick, Georgia.

Dr. Emit Ott, Hercules director of research, and other members of the research staff arranged the visits as a means of promoting better understanding between university and industrial research men. The trips provide an opportunity for the university groups to see how research is integrated with chemical production.

As a special feature of the trips, transportation from the universities to Hercules' Experiment Station and plants is provided by one of the company's Lockheed Lodester planes.

So far, students from two universities—Massachusetts Institute of Technology, April 4-8, and the University of Illinois, March 16-20—have been flown in. More trips for other universities are planned for the fall.

Students are selected by faculty and chemical engineering department heads on the basis of their interests and ability.

Pittco Plant Superintendent

Appointment of A. E. Cutler as superintendent of Pittsburgh Plate Glass Company's Pittco store-front metal producing plant at Kokomo, Indiana has been announced by John A. Wilson, vice president of the firm. Mr. Cutler succeeds Clyde J. Bristow who retired April 1.

A. E. Cutler

A native of Cedar Springs, Michigan, Mr. Cutler has been serving as assistant superintendent at the Kokomo plant since last May. Before joining Pittsburgh Plate Glass Company, Mr. Cutler for ten years was associated with the Kawneer Company, Niles, Michigan, as manager of methods and time-study, engineering and material processing. He also has been associated with Young Radiator Company, Racine, Wisconsin; Edward G. Budd Company, Philadelphia, Pennsylvania; Chevrolet Transmission Division, and General Motors Truck Company, Pontiac, Michigan.

SPRAY that builds *Endurance*

for the finest paint finishes

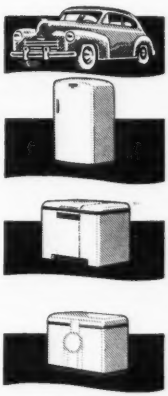
PROTECTED BY Bonderite PARKER RUST PROOF CO. FOR CORROSION RESISTANCE

It's the Bonderite spray! Metal parts traveling through it emerge with a close-grained coating of nonmetallic Bonderite crystals, ready to take and *hold* the final paint finish.

The Bonderite spray builds long life for paint. By inhibiting rust and corrosion and providing a secure anchor for the paint film, Bonderizing acts to prolong fine appearance and service life. Bonderizing is fast, economical, simply and positively controlled. Results are uniformly effective.

Automobiles, home appliances, office equipment—and many other metal products on which a *lasting* quality paint finish is important—are Bonderized.

Bonderized products look better longer!



YOUR Product, too, Deserves Bonderizing!

Guard its good looks—and your customers' satisfaction—by Bonderizing before the final finish. It costs little, adds much. Write today for full information.

Parker

PARKER RUST PROOF COMPANY
2172 East Milwaukee Ave.
Detroit 11, Michigan

BONDERIZING Holds Paint to Metal . . . PARKERIZING Inhibits Rust . . . PARCO LUBRIZING Retards Wear on Friction Surfaces

COME

TO THE

ROTO-FINISH

BOOTH NO. 164

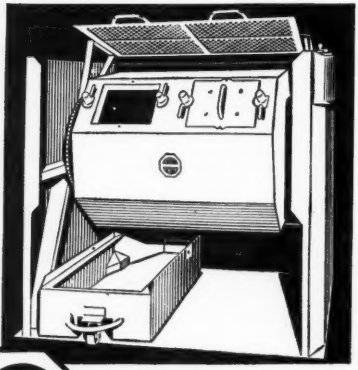
PLATING CONVENTION
June 28 to July 1, Atlantic City

★

SEE

HOW YOU CAN FINISH PARTS MECHANICALLY

- CUT LABOR COSTS
- SAVE TIME!



ROTO FINISH

THE STURGIS PRODUCTS CO.
431 Jacob Street
STURGIS, MICHIGAN

Dr. J. J. Mattiello Passes

Dr. J. J. Mattiello, vice president and technical director of the Hilo Varnish Corp., Brooklyn, N. Y., died in his sleep on May 16.

Dr. Mattiello had long been identified with and active in the field of paint and varnish chemistry and only recently was chosen as one of the ten ablest chemists now working in that field in the United States. Another recent honor which was conferred upon him was election as a Fellow of the New York Academy of Sciences.

Named Manufacturing Manager of G-E Compound Division

Appointment of H. Arthur Howe as manufacturing manager of the General Electric Company's Compound Division, producer of phenol, phenolic plastic materials, and magnesium oxide, was announced today by John L. McMurphy, division manager.

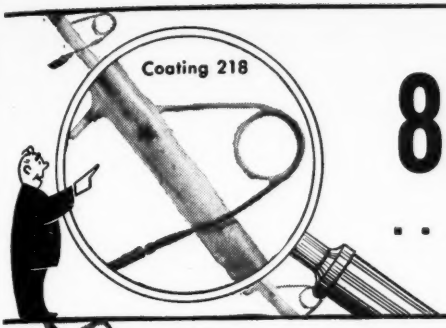
Mr. Howe, a native of Wilmington, Vermont, has been superintendent of the Compound Division since February 1947. He has been associated with the General Electric Company since 1933 when he started as a compound test man. Five years later he was placed in charge of the compound plant, continuing to hold this responsibility until the end of 1945 when he became operating engineer for the resin and varnish plant.

Ditzler Announces Two Promotions

William T. Utley, divisional director of the Ditzler Color Division of Pittsburgh Plate Glass Co., Detroit, Mich, has announced the appointment of two veteran employees as assistant sales managers of the distributor sales department under Neil A. Fleming, sales manager.

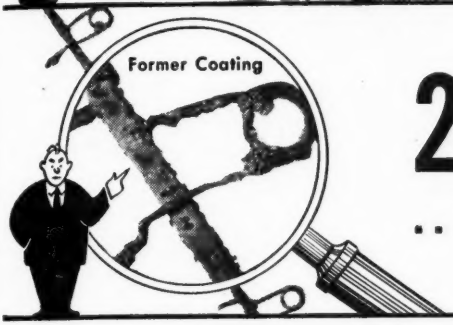
Neil W. Vogt, formerly manager of the distributor sales office, will handle new jobber business and export sales. Except for four years in the U. S. Army, where he attained the rank of captain, he has been a member of the distributor department for eighteen years.

Rolland L. Smith, formerly assistant sales promotion manager, has been connected with distributor sales for fifteen years and in his new position will take charge of sales training and educational work.



8 MONTHS

. . . and still going strong!



2 WEEKS

. . . and "all washed up"!

Unichrome Coating 218 delivers record service on rack

A WELL-KNOWN MANUFACTURER gave Coating 218 their most severe practical test—protecting a rack in their lead plating bath. The solution operates at about 220°, contains nearly 27 ounces of caustic per gallon. Yet even after *8 months* of this, Coating 218 shows only slight loss of resilience, is still as smooth as the day it was put on the rack. Former rack coatings were wrecked *within 2 weeks!*

An unusual case? No, for you can depend on Coating 218 in *any* plating cycle. This 100%-solids synthetic bakes into an elastic, scuff-resistant, chip-proof coating which resists all plating and cleaning baths. Learn how *you* can save time and money with it. Write for bulletin RC-1.

(If you have no baking oven, write us for the name of a local applicator who will coat your racks with 218)

UNICHROME

Trade Mark Reg. U. S. Pat. Off.

RACK COATINGS—Products of

UNITED CHROMIUM, INCORPORATED • 51 E. 42nd St., New York 17, N.Y.

Detroit 7, Mich. • Waterbury 90, Conn. • Chicago 4, Ill. • Dayton 2, Ohio • Los Angeles 13, Cal.

Appointed Southern Sales Representative for Glidden

The Glidden Company has announced the appointment of Clyde W. Hall as sales representative for industrial and maintenance finishes in the Southern territory. Mr. Hall was born and reared in the South and has had many years' experience in industrial finishes. His career has included service as finishing foreman in furniture manufacturing companies, as well as service and sales work for manufacturers of industrial finishes.

The new Glidden representative, who will make his headquarters in Memphis, will be equipped to provide complete finishing service to users of industrial and maintenance finishes aided by the extensive facilities for research, development, and technical service of the Nubian Industrial Division of the Glidden Company.

Pittsburgh District Sales Representative Appointed

John M. Davidson has been named Pittsburgh district representative for the Special Chemicals Division of the Pennsylvania Salt Manufacturing Co., Philadelphia 7, Pa., according to an announcement by Joseph J. Duffy, Jr., manager of sales. Mr. Davidson formerly was sales representative in the Northern New Jersey and New York City territory.

Mr. Davidson fills the post formerly held by William J. Hennessy, now Pittsburgh district sales manager of the Special Chemicals Division.

Mr. Davidson graduated from Dickinson College with a bachelor of arts degree and earned a degree of master of education at Temple University. Prior to joining Pennsalt in July 1946, he taught at high schools in Clayton, New Jersey, Pitman, New Jersey, and New York Military Academy, and was a salesman for the Ediphone Company, Philadelphia.

The Secret... of a good finish "MAGIC" TACK RAGS

Before applying enamel, paint, varnish or lacquer wipe surface gently with a "Magic" Tack Rag. It will remove specks, lint and all foreign matter—and ensure a smooth deep luster and produce a faultless surface. Order today.

WILLIAM A. JUERGENS CO.

4036 LA GRANGE ST. TOLEDO, OHIO

Midwestern Manufacturing Company Joins with Optimus Equipment Company

Optimus Equipment Co., Matawan, N. J., manufacturer of metal parts vapor degreasers, washing and drying equipment, has announced the joining of that company and the Midwestern Manufacturing Co., New York, N. Y., manufacturer of vapor degreasers.

The Midwestern line of vapor degreasers and degreasing solvents will be continued supplementing the present line of Optimus products. The company will continue under the name, Optimus Equipment Company, with headquarters and manufacturing facilities at Matawan, New Jersey.

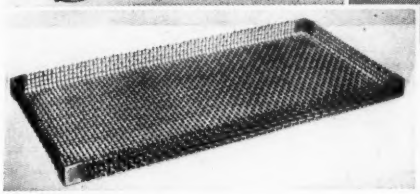
The officers of the new company are V. W. Todd, chairman of the board; M. Jaffa, president; A. T. Baldwin, vice president; and E. N. Close, secretary and treasurer.

Ferro Installs Continuous Electric Frit Smelter

The installation of electrically fired continuous frit smelting equipment for the production of porcelain enamel frit has been announced by the Ferro Enamel Corp., 4150 E. 56th St., Cleveland 5, Ohio.

According to Dr. G. H. McIntyre, vice president and director of research for Ferro, the principal advantage of the installation is that it makes possible an improved standard of product uniformity and quality. Use of the continuous

Cambridge WIRE CLOTH and FABRICATIONS...



From large annealing and pickling crates to small trays or baskets, Cambridge fabricated wire products are built especially for your requirements.

"JOB-FITTED" to your installations

Whether your products are heated, pickled, or chemically treated, the Cambridge fabricated wire products designed especially for your problem are "JOB-FITTED" for maximum performance and operating economy. » » » Specific metals or alloys . . . certain meshes or weaves . . . are selected from our past engineering experience with the conditions under which your wire assemblies must be used.

FREE! Illustrated folder describing crates, trays, baskets, and racks custom built by Cambridge for bulk handling operations. Write for your copy today.

Call in your Cambridge engineer whenever you have a problem involving specialized wire fabrications. There's a Cambridge Sales Office near you.

Cambridge Wire Cloth Co

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smelter has resulted in the development of smelting techniques which will make possible further improvements in porcelain enamel frit, it is stated.

Announce A.E.S. Exposition Space

The Standard Electrical Tool Co., 2518 River Rd., Cincinnati 4, Ohio, will occupy Booth No. 101 and exhibit variable speed buffing and polishing lathes at the A.E.S. Industrial Finishing Exposition in Atlantic City. The following members of the firm will be in attendance: William A. Ferguson, president; J. J. Falls, vice president; J. J. Kopp, treasurer; and W. J. Holtmeir, Eastern representative.

Frederic B. Stevens, Inc., Detroit 16, Mich., wil occupy Booths No. 57 and 58 at the American Electroplaters' Society Industrial Finishing Exposition and will be represented by: R. H. Alden, R. C. Bender, H. M. Brown, Guy Cummings, E. T. Homan, J. M. Johnston, A. H. Kirkpatrick, A. H. Losey, J. M. Mayers, C. J. Menzemer, A. F. Norgren, Franklyn Roberts, and H. M. Stevens.

Waverly Petroleum Products Co., Philadelphia 6, Pa., will occupy Booth No. 139 at the A.E.S. Industrial Finishing Exposition and will exhibit an improved Troxide used for pickling and bright dipping of metals. Firm members in attendance at the Troxide exhibit will be: George E. Willey, president; Edward P. Frankel, general manager; T. F. O'Brien, manager, industrial chemical division; E. W. Coogan, Pennsylvania representative; and F. A. Miller.

The Optimus Equipment Co., Matawan, N. J., manufacturer of metal parts vapor degreasers, washing and drying equipment, and the **Midwestern Manufacturing Co.,** New York, N. Y., manufacturer of vapor degreasers, will exhibit jointly at the American Electroplaters' Industrial Finishing Exposition at Atlantic City, June 28-July 1. In Booth No. 4, Optimus Equipment Company will display a Midwestern vapor degreaser in conjunction with a photograph display of Optimus equipment and a display of Optimus detergents. In Booth No. 172, Midwestern will display a Midwestern vapor degreaser as well as an Optimus metal parts washer. These booths will be manned by Messrs. M. Jaffa, Allen T. Baldwin, Walter L. Fideluis, H. Schroeder, and J. Hersh.

Greetings

To All Conventionites

The Magnuson Products Corporation extends best wishes for the success of the 1948 Convention. Recent years have been marked by new achievements in the science of metal finishing. Technical knowledge combined with long practical experience of men skilled in this field have brought greater advancement and more rapid progress to individual plants as well as to the society as a whole.

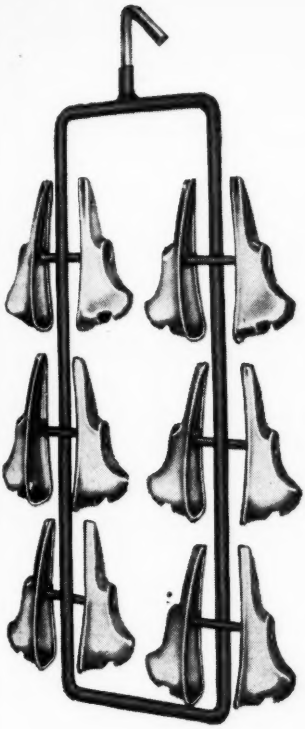
The Magnuson Corporation now in its 25th year of service to electroplaters, highly values the long and agreeable association with this active and expanding industry.

Sustaining Member A.E.S.

MAGNUSON
PRODUCTS CORP.
BROOKLYN 2, N. Y.

1923 - 1948
Our 25th
YEAR

Canadian PERMAG Products Ltd. **Montreal** • **Toronto**



NO. 1000

INSULATION

For racks and fixtures used in electro plating, anodizing, electro polishing, phosphate coating and electro forming.

SAVES LABOR

Has extra fluidity. Dips freely. Handles fast, without delays or trouble. A rack can be completely insulated in two hours.

SAVES TIME

No evaporation — no shrinkage — no loss. Short oven bake converts to continuous solid coating that has no effect on, but excellent resistance to all plating solutions and cleaners.

SAVES MONEY

Racks last longer because a single dip gives an extra heavy, thick, extremely tough, long life protective coating, which far outwears ordinary types of insulation—and at less cost.

100% SOLIDS

No liquid to evaporate. Does not become thick or lumpy. Always ready to use. Not inflammable.

Write for details and prices

APPLICATORS

If you prefer to send your racks out for insulating write for name and address of nearest applicator using No. 1000 Insulation. That means you get the best at the right price.

NELSON J. QUINN COMPANY

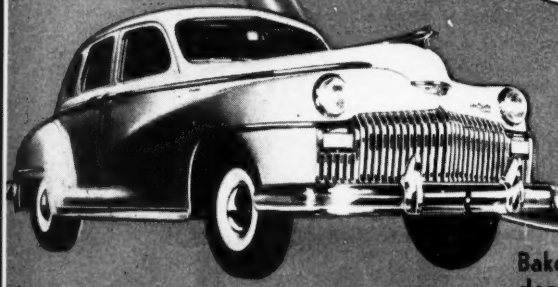
TOLEDO 7, OHIO

BUNATOL

The baking enamel on the lower panel of the 1948 Hudson sedan pictured here is one shade lighter than that used on the rest of the body, thus providing a pleasing contrast and an innovation in motor car styling.

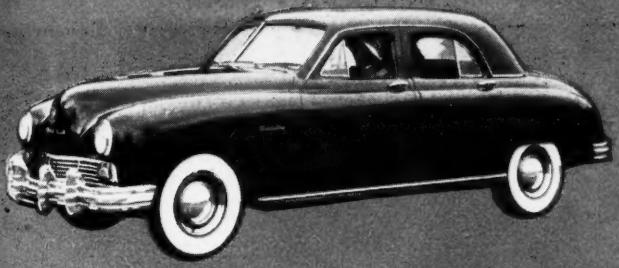
(Photo courtesy Hudson Motor Car Co., Detroit 14, Mich.)

Finishes that aid in appearance and utility



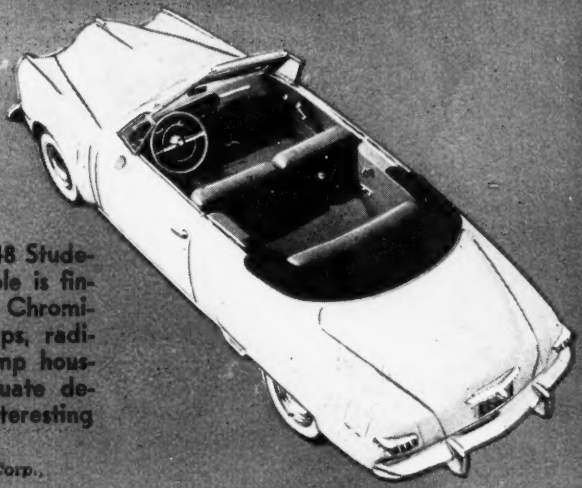
Baked-on enamel and chromium plate decorate the exterior surfaces of the DeSoto four-door sedan illustrated herewith. Cadmium plate, copper plate, and zinc plate are used to protect various other body or engine parts.

(Photo courtesy Chrysler Corp., Detroit 31, Mich.)



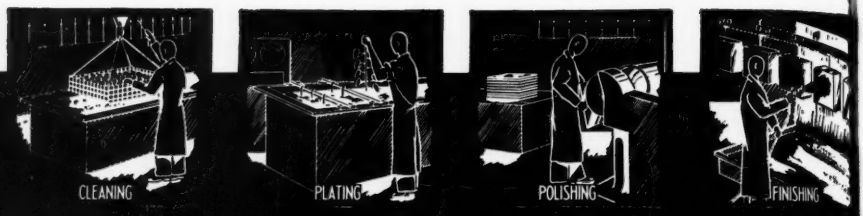
● The Frazer Manhattan pictured herewith is finished in two coats of combination prime and surfacer, baked ½ hour at 270 deg. F., plus two coats of final finish enamel, baked ½ hour at 275 deg. F. Bumpers, grille, hub caps, door handles, and trim items are chromium plated.

(Photo courtesy Kaiser-Frazer Corp., Willow Run, Mich.)



The all-steel body of this 1948 Studebaker Commander convertible is finished in color baking enamel. Chromium plated bumpers, hub caps, radiator grill, door handles, lamp housings, and ornaments accentuate design features and form an interesting contrast to the body finish.

(Photo courtesy Studebaker Corp., South Bend, Ind.)



Kellogg Fractional Horsepower Air Compressors

Two models of portable fractional horsepower air compressors have been announced by the Kellogg Division, American Brake Shoe Co., 97 Humboldt St., Chicago 9, Ill. Both models are said to be particularly adaptable for low pressure high volume work where maximum efficiency and economy are required.

Model 8-C delivers 2.2 c.f.m. at 25 pounds pressure. It is powered with a ¼ h.p. electric motor. Equipped with a single air cleaner, this model has no cylinders, pistons, or rings. A force feed oil system assures positive lubrication. The unit is mounted on a sturdy steel base with rubber feet.

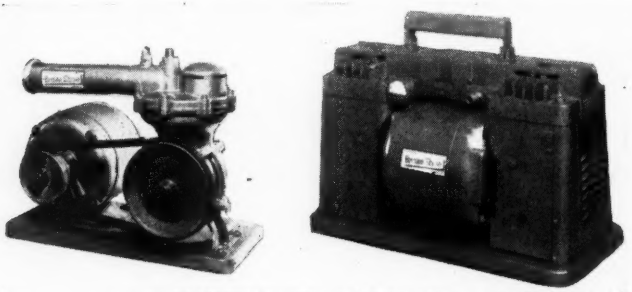
Model 17-C delivers 4.4 c.f.m. free air at 40 pounds pressure. It is powered with a ¼ h.p. electric motor. Newly designed "lubricated for life" sealed ball bearings eliminate the necessity of oiling and the danger of burned-out bearings, it is claimed. The entire mechanism is encased in a welded steel frame for greater stability. The model has twin air cleaners which are easily accessible.

According to the manufacturer, special designing has eliminated all contact or contamination of the air with lubricating oil so that oil-free air may be produced. The compressors are said to be readily adjustable for various pressures.

Synthe-Chrome

A synthetic organic coating said to be similar in appearance to chromium plate has been announced by V. J. Dolan & Co., Inc., 1830 N. Laramie Ave., Chicago 39, Ill. Designated as Synthe-Chrome, the coating may be sprayed on and baked at 300 deg. F. for 20 minutes to produce the desired finish.

According to the manufacturer, Synthe-Chrome produces a durable coating which is acid and alkali resistant and which resists discoloration in aging. The coating is said to have excellent resistance to mechanical damage and ordinary wear and tear.



Kellogg Fractional Horsepower Air Compressors, Model 8-C (left), Model 17-C (right)

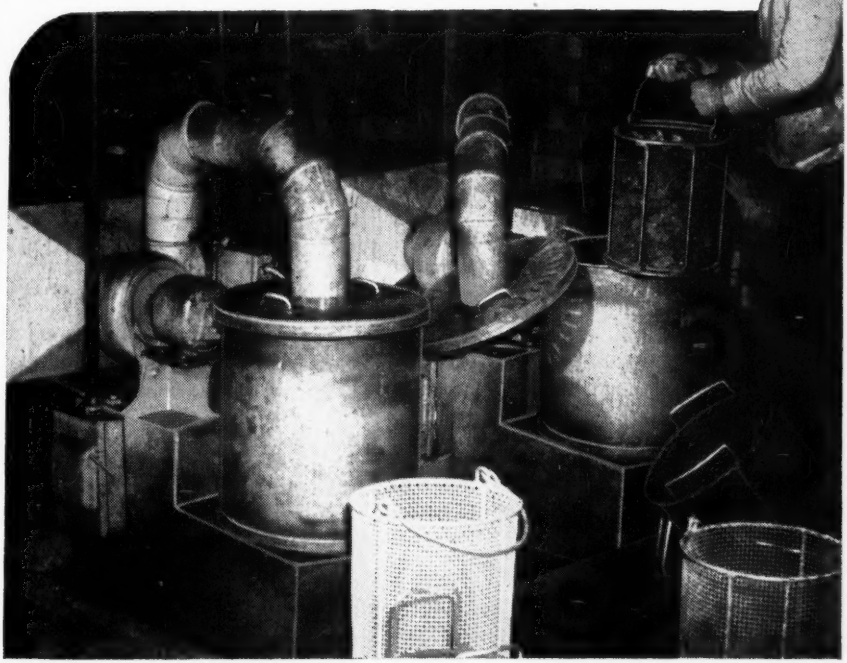
Extra PROFITS FOR YOU

are engineered into the Kreider Dryer

Here's the speedy, one-man operated Kreider Centrifugal Dryer, designed for faster output . . . lower cost operation . . . increased profit per unit for you. The Kreider Dryer will dry a basketful of small parts thoroughly in only 35 seconds, leaving a lustrous, evenly dried finish which has greater rust resistance. Operation and maintenance costs are low; requires minimum floor space. V-belt drive and ¾ HP motor are standard; auxiliary heating unit available. *Write for illustrated bulletin with Kreider Centrifugal Dryer installations and complete specifications.*

DELLINGER MANUFACTURING CO.

729 N. PRINCE STREET - LANCASTER, PA.

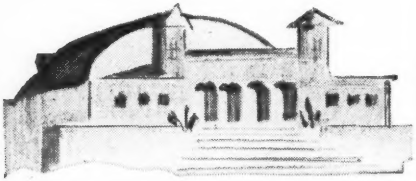


ATLANTIC CITY
by-the-sea

JUNE 28 TO JULY 1

INDUSTRIAL FINISHING EXPOSITION

A comprehensive exhibit of equipment and supplies for manual and automatic electroplating, polishing and buffing, cleaning and degreasing, tumbling and burnishing, enameling and lacquering, and allied processes. Of interest and value to all manufacturers concerned with metal surface treatment.



Make plans now to attend this Exposition and Convention. Exposition and Technical Session in Atlantic City's Convention Hall; Convention Headquarters in Ambassador Hotel. Sponsored by the A.E.S. Newark Branch.

For further information, write

American Electroplaters' Society

Convention and Exposition Committee
35 FOURTH STREET
NEWARK 7, N. J.

Palmer-Shile Keg Truck

A lightweight keg truck designed to provide users of kegs and barrels with an efficient means of handling has been announced by the Palmer-Shile Co., 12613 Mansfield Ave., Detroit 27, Michigan.

Constructed of heavy tubular steel welded throughout and equipped with

Palmer-Shile Keg Truck

metal, rubber, or pneumatic wheels mounted on roller bearings the keg truck is said to be easy to operate or transport. In operation, the keg truck is positioned against the keg to be lifted, to enable steel spikes on the truck to engage the base of the keg. A sliding safety catch on the keg truck engages either the lip or open end of the keg, and holds the keg securely during transport, it is claimed.

Flatjet Nozzle Guard

Spraying Systems Co., 4021 W. Lake St., Chicago 24, Ill., has announced a spring guard for its Flatjet nozzle. Ac-

STAY A KANGAROO JUMP AHEAD ---

Remove Organic Impurities with DARCO

Your finished work will be uniformly bright if you stay a long jump ahead and keep your solutions free of colloids and organic matter with DARCO*.

Some impurities will pass through a mechanical filter, no matter how fine the filter medium may be. You need DARCO S-51 to get solutions so clean that rejects and lost time due to spots, dullness and poor adhesion may be avoided.

DARCO S-51 is amazingly low in cost. A little over a dime a week buys enough to keep 100 gallons of solution in a state of first-class cleanliness.

Write for a sample or order a supply from your jobber today.

DARCO

Is your plating bath as clean as the water used in your final rinse?

DARCO CORPORATION

*Darco—Reg.U.S.Pat.Off.

60 E. 42nd Street, New York 17, N. Y.

cording to the manufacturer, the guard protects the large deflector face of the nozzle without interfering with the spray. This protection is said to be desirable in-

Illustration showing Flatjet nozzle with spring guard attached

asmuch as damage to the face of the deflector may alter the characteristics of the Flatjet spray.

Columbia Roll Coating Machine

A machine to facilitate coating flat material with drawing compound, sizing, wax, paint, or lacquer known as the Columbia Roll Coating Machine has been announced by the Columbia Machinery and Engineering Corp., Hamilton, Ohio. Coating is accomplished by a 10-inch coating roll and an 8-inch doctor roll. The large coating roll reduces the angle of departure from the work, providing for a uniform spread, maximum capacity, and easy control of coating material, it is claimed.

According to the manufacturer, the doctor roll turns at a speed slower than that of the coating roll, and this difference produces a wiping action that contributes to even spread of coating material. Precise depth of spread is set and maintained by a simple adjustment of a calibrated handwheel. The standard drive speed is 75 f.p.m. but other speeds may be had through the use of variable speed drives. The surface speed of the doctor roll is adjustable.

Rolls, tables, and troughs are said to be easily removable for cleaning. Motor and drive are fully enclosed, located outside the end frame. Various safety features are included in the design to ensure maximum operator protection.

PPG-IDL Color Eye

A photoelectric instrument known as the PPG-IDL Color Eye has been announced by the Pittsburgh Plate Glass Co., Pittsburgh, Pa., and will be marketed by the Instrument Development Laboratories, Inc., Williston Park, Long Island, N. Y. According to the manufacturer, the Color Eye measures color differences and divides by the total reflected light to make comparisons in terms of percentage reflectance difference, regardless of the illumination level.

The Color Eye will find application in the textile industry, paint manufacturing industry, and other manufacturing industries where accurate color matching is essential. Said to be more accurate than its human counterpart in measuring reflecting samples as well as clear or diffuse transmission samples, the Color Eye provides a combination of diffuse and direct illumination at the optimum angle of illumination for measurements where surface gloss is important. The instrument's normal sample area view is ½ inch in diameter but it can accommodate samples from 1 inch to several feet in size.

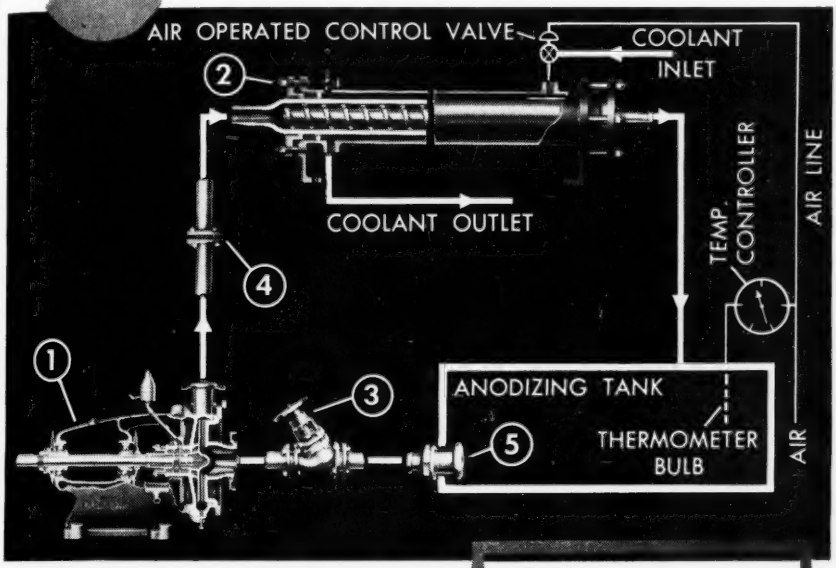
Color differences are read directly on a meter having two ranges. Approximate luminosity is read directly on a logarithmic scale from 0.1 to 100 per cent. Accurate luminosity or tristimulus values may be obtained by a direct reading micrometer-controlled optical aperture com-

PPG-IDL Color Eye

paring the sample to a white standard.

The Color Eye is said to be substantially unaffected by illumination level and stray light. Colors matched by this device are said to be industrially satisfactory regardless of the detailed spectrophometric color curve of the samples.

5 REASONS WHY THIS ANODIZING SET-UP STANDS UP AGAINST CORROSION



Five kinds of Durco equipment defend your anodizing installation against corrosive attack. This equipment is self-protected by the alloy of which each unit is made, Duriron.

Duriron is a Durco iron alloy containing approximately 14.5% silicon. This element gives it an extremely high resistance to sulfuric and chromic acid and to a wide range of other corrosives. Duriron's corrosion-defeating ability is permanent and uniform throughout.

Durco Adv. 26-GM

DURCO EQUIPMENT FOR ANODIZING

1. MODEL 40 DURCOPUMPS — With capacities up to 2000 GPM for heads up to 230 ft.
2. DURCO NO. 4 HEAT EXCHANGER —4C cooler, capacity 45,000 to 90,000 BTU per hour. Multiple units in either series or parallel arrangement, if additional capacity is required.
3. DURCO Y VALVES—Full opening with nearly straight flow.
4. DURCO SPLIT FLANGED PIPE AND FITTINGS—in sizes from 1" to 8" I.D. Larger diameters made to order.
5. DURCO TANK OUTLETS—For either thin or thick wall tanks and for flanged or lead pipe connections.

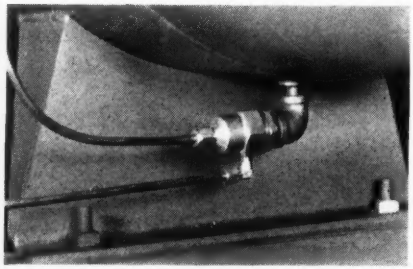
For complete information on all of the above types of Durco equipment ask for Bulletin Folder R.

DURCO
CORROSION RESISTING ALLOYS & EQUIPMENT

THE DURIRON COMPANY, Inc.
DAYTON 1, OHIO, U.S.A.

Lansdale Automatic Water Unloader

A fully automatic water unloader which removes all water and oil from the air compressor tank has been announced



Lansdale Automatic Water Unloader

by the A. Shelburne Co., 739 Ceres Ave., Los Angeles 21, California.

Designed to fit any electrically operated air compressor which is equipped with a centrifugal or magnetic unloader, the Lansdale Water Unloader is said to eliminate manual draining of the tank by automatically drawing off the harmful water and oil as it collects. According to the manufacturer, the elimination of this accumulation avoids the possibility of its being forced into the air lines, causing corrosion or clogging of tools or spray equipment.

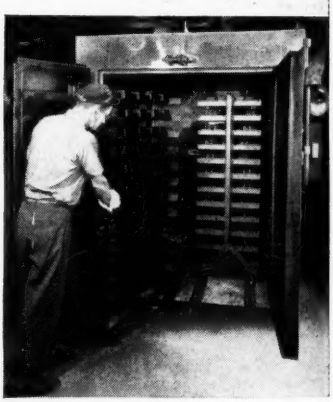
As a means of filtering out particles of rust and dirt and preventing possible damage to the unloading mechanism, the unloader has a wire mesh screen inserted ahead of the mechanism.

Rossaul Dispensoap

A borax-based powdered hand cleaner, known as Dispensoap, has been announced by the Rossaul Co., 170 Fifth Ave., New York 10, N. Y. According to the manufacturer, Rossaul Dispensoap removes grease, dirt, ink, vegetable dyes, chromic acid stains, and other contaminations. Further, it is said to be highly abrasive in its action on skin contaminations yet gentle enough to be used on the skin. Dispensoap is completely soluble in water so that it will not clog drains, it is claimed.

FAST FINISH BAKING

Refinished Relay Covers and other Control Parts Formerly Air Dried in 8 Hours—Now a Better Wrinkle Finish is Baked in ONE HOUR with the



Despatch R. S. FINISH BAKING OVENS

Minneapolis-Honeywell Regulator Co. uses the above Despatch R S Oven for refinishing of controls sent in for repair. The black wrinkle enamel on the relay cover shown is baked to an extremely hard, durable finish in 1 hour at 300° F. saving 7 hours of former air drying time! Other parts are baked ½ hour at 350° F. This fast baking of finishes speeds up the entire repair program, improves service to customers.

Despatch R S Ovens are well insulated, very economical, 100% controlled for uniform heat up to 500° F., with temperature variation seldom more than 3° ± F. Built in a range of sizes for a great variety of applications. Tell us your needs—

DESPATCH OVEN CO. Established in 1902

Write us for literature

Manufacturers of ovens for: **Paint Finishing, Dehydrating, Curing, All Industrial and Laboratory Applications.**

327 DESPATCH BLDG. 8th St. at 7th Ave.S.E., MINNEAPOLIS 14, MINN.

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POLISHING and BUFFING COMPOSITIONS

BOOTH 179 and 180

INDUSTRIAL FINISHING EXPOSITION

• • The increasing popularity of Buckingham Products Polishing and Buffing Compositions indicate that more and more metal finishers are becoming aware of the many advantages these products offer.

3517

THE BUCKINGHAM PRODUCTS COMPANY

14100 FULLERTON AVE. • DETROIT 27, MICH.

Singleton-Weld Process

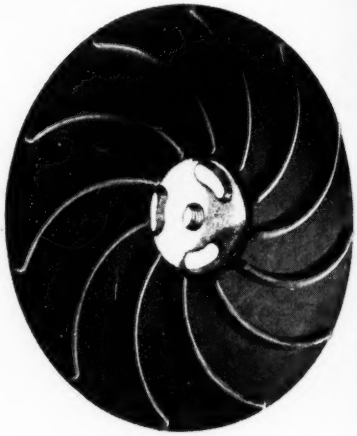
A process for fabricating tanks from high temperature Lucite has been announced by the Singleton Co., 9823 Lorain Ave., Cleveland, Ohio. Lucite tanks of various sizes and types for laboratory and production plating have been fabricated from Lucite plastic by applying the exclusive Singleton-Weld Process.

Tanks fabricated by this process are claimed to have the following advantages: resistance to acids, alkalis, contamination, and deterioration; high impact strength; machineability; light weight; and economy. The tanks are transparent so that parts being plated may be observed during the operation. It is further claimed that Lucite tanks now in use commercially and in laboratories have shown no ill effects after months of continuous exposure to the complete range of plating temperatures and solutions.

"Spiralcool" Backing Pad

A backing pad for disc sanders, known as "Spiralcool," has been announced by The Pratt Manufacturing Co., Inc., Fairmount, Indiana.

The backing pad is made of layers of rubber reinforced with fabric and securely bonded to a slotted iron hub. According to the manufacturer, slots in the hub force air through to the back of the sanding disc, keeping it cool and minimizing the loading up of the abrasive disc. The pad, being made of rubber, is claimed to prevent gouging and provide improved contact area of the disc when used on irregular shapes.



"Spiralcool" Backing Pad

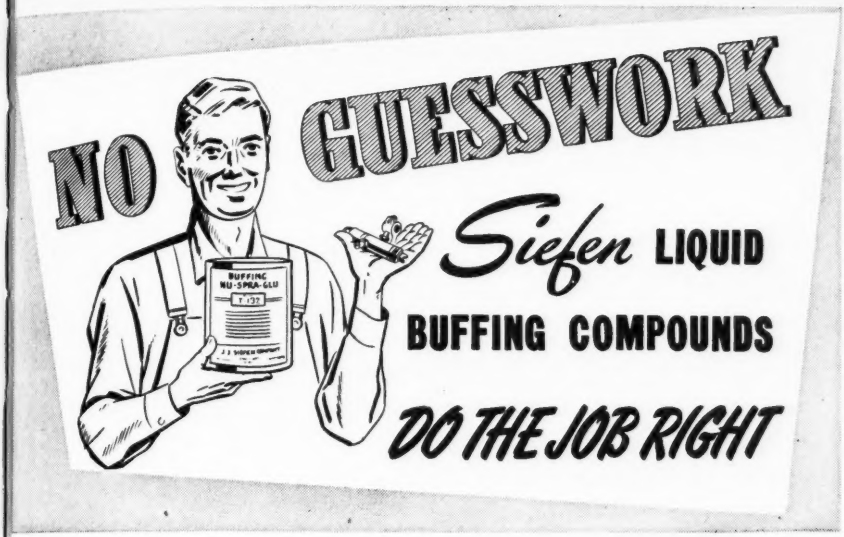
MURCO
TUMBLING BARRELS
Compact simple design .. Low Maintenance
Provide a wide range of speeds to meet various operating conditions ... designed and built to withstand heavy duty service, MURCO Tumbling Barrels have special features of interest to plants that deburr, burnish, clean and polish ... safe to operate.
SPEED CHANGES WHILE BARREL IS IN MOTION!
Write! for complete details and prices.
D. J. MURRAY MANUFACTURING CO.
WAUSAU - WISCONSIN

Lufax 77A Zirconium Opacifier

A zirconium opacifier for porcelain enamels, known as Lufax 77A, has been announced by the Rohm & Haas Co., Philadelphia, Pennsylvania.

According to the manufacturer, Lufax 77A has been found suitable for use with most of the commercial zirconia opaque enamels currently employed in the industry. It is claimed that the opacifier is designed to provide satisfactory results in enameling plants where firing conditions tend to be somewhat variable.

Porcelain enamels opacified by Lufax 77A are said to be characterized by stability, maintenance of gloss and opacity over a wide firing range, stabilized color in the desirable range, high impact strength, scratch resistance, and flexibility of application.



TOP QUALITY • FAST CUTTING • LONG LASTING

THE SIEFEN COMPANY originated the spray method of applying compound, developed trouble-free spray guns for most economical use of the spray method and is keeping ahead of the field in the manufacture of the finest quality liquid compounds.

Siefen Liquid Compounds cut as fast as bar compounds, are non-settling, clog-free, and fire resistant.

Our engineers throughout the country are at your service to demonstrate how the Siefen Spray Method can cut your buffing costs.

AND REMEMBER —
NUGLU or BRUSHING NUGLU

(Nuglu and abrasive mixed) are being used for recoating abrasive belts and discs.

J. J. SIEFEN COMPANY

5633 LAUDERDALE • DETROIT 9, MICH.

Ahcoloid Emulsion Cleaner

An emulsion cleaner designed specifically for cleaning buffed zinc base die castings or aluminum parts has been announced by the Apothecaries Hall Co., Waterbury 88, Conn. Known as Ahcoloid Emulsion Cleaner, the material may be operated at room temperature in ordinary steel tanks. It is classed as a safety solvent with a flash point of 100 deg. Fahrenheit.

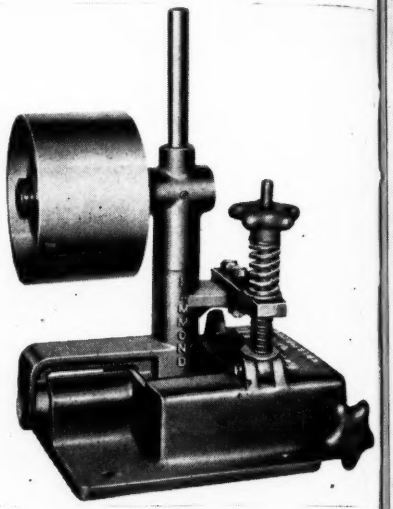
According to the manufacturer, the material contains special surface active agents which impart to it a high degree of emulsifiability, wetting and penetrating action, and rapid rinsability.

Ahcoloid Emulsion Cleaner is designed to be used as received without the addition of water or other solvents. Cleaning time will vary with the degree and type of contamination, it is said. After cleaning it is recommended that parts be rinsed in either cool running water, cold water sprays, or warm water. If the work is to be plated, a light alkali cleaning following rinsing is described as desirable. For finishing operations such as blackening, phosphating, painting, or lacquering, the work is usually sufficiently clean after treatment in Ahcoloid Emulsion Cleaner.

Hammond Model 6-B Bench Backstand

A bench backstand having an 8 x 4½-inch pulley for accommodating up to 4-inch width abrasive belts has been placed on the market by Hammond Machinery Builders, Inc., Dept., GP-25, 1600 Douglas Ave., Kalamazoo 54F, Mich. Identified as the Model 6-B, the backstand has a net weight of 75 lb. and is said to be especially desirable for limited space wall or ceiling mounted installations.

The 8-inch diameter x 4½-inch face aluminum pulley of the unit is dynamically balanced and mounted on sealed lifetime-lubricated precision ball bearings. The heavy cast iron base of the backstand is drilled for mounting purposes. The design of the unit also includes a convenient release lever for quick, easy changing of belts; spring-loaded belt tension adjustment operated by a convenient sure-grip hand screw; and positive hand screw operated belt tracking adjustment. The backstand is produced in right and left-hand styles and can be obtained with a bracket for wall or ceiling mounting.



Hammond Model 6-B Bench Backstand

For Sale
SLIGHTLY USED
BUFFS
Loose and Sewed —
Any Quantity —
All Sizes.

MICHIGAN BUFF CO., INC.
3505 GAYLORD AVE. • DETROIT 12, MICH.

GOLD PLATING SOLUTIONS
In All Colors
Guaranteed 100% Pure Gold Content
Troy Weight - Color Constant
Tarnish Resistant
Proven Quality by the Acid Test
Write or call our experts about your plating problems

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The Baker Line of Gold Plating Solutions

We have now added a new series of solutions to our line. These are:

Concentrated Gold Plating Solution No. 319, containing one troy ounce of fine gold.

Concentrated Gold Replenishing Solution No. 320, containing one troy ounce of fine gold.

Concentrated Underplate or Strike No. 321S, containing one-half ounce of fine gold.

Gold Coloring Solutions for Light Yellow, Red and Green Gold.

Let us send you our instruction booklet for these.

If you are contemplating new installations or changes in your present equipment, we may be able to help you with money saving suggestions. We shall be glad to have you consult us.

BAKER & CO., INC.
113 Astor Street
Newark, N. J.

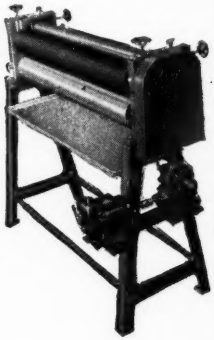
Mercury Pressure Filter

A multiple plate filter for the pressure filtering of water, chemicals, paint, varnish, solvents, plating solutions, and other materials has been announced by the Mercury Cleaning Systems, Inc., 549 W. Washington Blvd., Chicago 6, Ill. The unit is rated at 1,000 g.p.h. and can be used in multiple to provide for larger capacity.

The Mercury Pressure Filter employs a spring ring clamp which is tested at 120 p.s.i. hydrostatic pressure for clamping the lid of the filter. The clamp can be removed instantly and is said to thus simplify opening of the filter. The cleanout port cover is easily removable by a quarter turn of the cover without the use of wrenches, it is claimed. Filter plates, frames, and lining can be furnished in materials required for specified industrial applications.

Naz-Dar Roller Coating Machine

Designed to coat sheets with paints, varnishes, lacquers, enamels, or synthetics at great speed, an improved roller coating machine has been announced by the Naz-Dar Co., 469 Milwaukee Ave., Chicago 10, Ill. The machine is said to have the advantage of being able to co



Naz-Dar Roller Coating Machine

various rigid or semi-rigid materials such as metal, glass, or wallboard. It can be adapted for use in furniture factories, metal finishing factories, and many other industries.

WHATEVER YOUR POLISHING PROBLEM
Harrison
HAS THE ANSWER!
HARRISON 4A COMPOUNDS
● Cut faster
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Our 25 years experience, exclusively in buffing and polishing compounds, assures you of the right compound for the right metal.
Send a sample— ask for representative to call.
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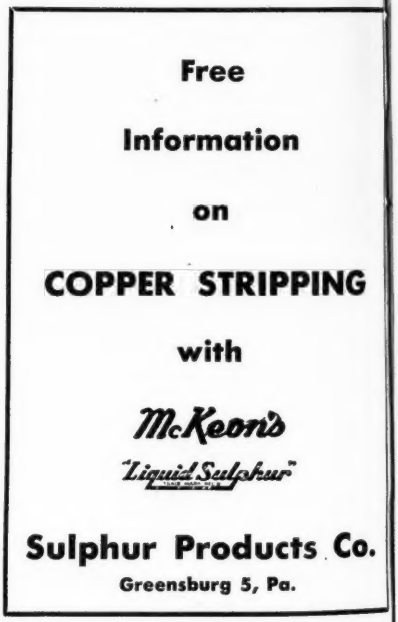
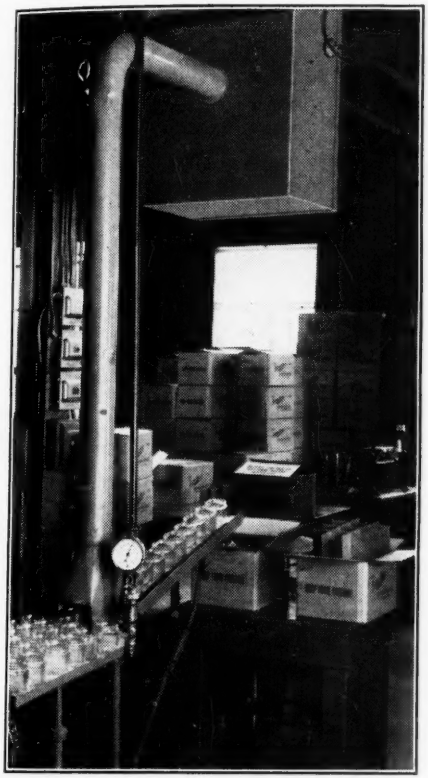


TORIT DUST COLLECTORS

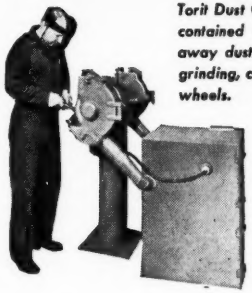


Help keep the shavings out of shaving

The manufacturer of a famous shaving cream was having trouble removing the dust, bits of paper, and other material found in jars as they came from the supplier. Costly hand methods were used until the ingenious unit at the left was set up.

In this operation jars move under a hood, where an air jet blows the foreign matter loose and into the suction stream of a TORIT No. 52 Dust Collector. Sterilizing is done at the same time, and the jars move directly to filling machines.

This installation shows the adaptability of TORIT Dust Collectors to unusual tasks. Compact and self-contained, they fit all production layouts and can be moved as necessary. Models for standard grinding, polishing and cut-off machines are available for immediate delivery. For details and the latest TORIT catalog, write:



Torit Dust Collectors are self-contained units for carrying away dust-laden air around grinding, cutting and polishing wheels.

TORIT
MANUFACTURING CO.
314 WALNUT ST. • ST. PAUL 2, MINN.

ELECTRO
COLD STRIPPER

▸ Cleanly and quickly removes all paints, enamels, synthetics or wrinkles. The finish literally "pops off."

▸ Permits refinishing in minutes—not hours. Especially effective on hard-to-remove baked-type finishes.

▸ Non-inflammable. Non-injurious.

Write for sample and quotations, or order 5 gallons at drum price.

ALLIED FINISHING SPECIALTIES CO.
2637 W. Grand Ave., Chicago 12.

Quality Chemicals for over 50 years

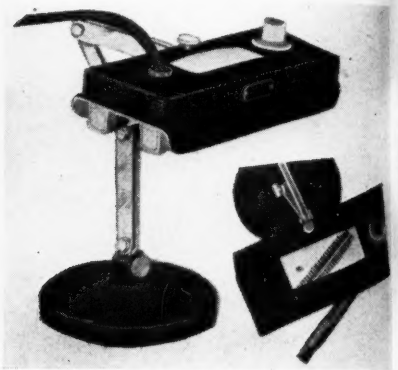
PHELPS DODGE REFINING CORPORATION
NICHOLS
TRIANGLE BRAND
REG. U. S. PAT. OFF.
CHEMICALS
40 WALL ST. NEW YORK

COPPER SULPHATE
NICKEL SULPHATE
COPPER OXIDE

Stocker & Yale "Lite-Mite" Magnifier

An illuminated magnifying inspection fixture to make possible inspection or comparison of materials, finishes, and colors has been announced by Stocker and Yale, 48 Birch St., Marblehead, Massachusetts.

According to the manufacturer, objects being observed and inspected are illuminated from widely divergent angles so that all surfaces are revealed in detail and internal surfaces of holes and cavities can be seen with ease. The device is small and lightweight, and is furnished with an easily adjusted supporting bracket so that it may be used for machine or bench installations. Four-watt lamps rated at 2,500 hours normal life provide an illumination of 350 foot-candles, it is claimed.



Stocker & Yale "Lite-Mite" Magnifier

Actane Addition Agent

An addition agent designed for use in acid dips prior to bright nickel plating has been announced by Enthone, Inc., Dept. PF, New Haven, Conn. Known as Actane, the addition agent is added to hydrochloric or sulphuric acid dips employed prior to bright nickel plating.

According to the manufacturer, the function of Actane is to disperse and remove colloidal films, deposited during cleaning, from the surface of metals to prevent the subsequent plate from becoming spotted, streaked, or stained. It

There's a Pittsburgh Power Driven Brush for every Industrial Use!

- GLASS
- STEEL
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- RUBBER
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Pittsburgh brushes are specifically designed to meet your particular finishing requirements. They're tough enough, stiff enough to resist abrasions. They're soft enough to improve surface texture. And the perfect balance of Pittsburgh brushes carefully controls distribution of the brushing stock—provides top efficiency, enduring economy.

In the complete Pittsburgh line are brushes of all types. "Perfect Balance" sections. Wheels and assemblies. Uni-fill scratch brushes.

Consult the Pittsburgh engineering representative today. He'll gladly work with you in developing any type of power-driven brush. And you can be sure it'll do the job right!

FREE!

Steel rule and depth gauge, 6", complete with pocket clip, and attractive leather case. Yours for the asking . . . write Pittsburgh Plate Glass Company, Dept. W-6, Baltimore 29, Md.

Power Driven **BRUSHES**

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PITTSBURGH PLATE GLASS COMPANY

is claimed that satisfactory results have been obtained from the use of this material in acids used for dipping non-ferrous metals such as copper and brass prior to bright nickel plating.

It is suggested that one ounce per gallon of Actane be added to the acid dip used in the plating process. It is claimed that the use of this material keeps the acid dip clear and provides easy rinsing. There is said to be no loss of adhesion as a result of using Actane in acid dips.

Industrial Steel-Grip Safeguard No. 225L Glove

An improved leather reinforced asbestos gauntlet glove has been designed by Industrial Gloves, Danville, Ill. Reference to the accompanying photograph shows that the usual seam on the palm or working surface, where thumb and palm are joined, has been eliminated. There is no seam to rip or burn out at this very important part of the glove.

Industrial Steel-Grip Safeguard No. 225L Glove

The new construction feature applied to this type of glove provides a continuous leather wearing surface over the asbestos palm, fingers, and thumb. The seam that makes the thumb now is on the top edge of that digit, well out of the wearing zone.

Both lined and unlined gloves are available in 11 and 13-inch standard lengths as required for various applications.

ALLWOOD

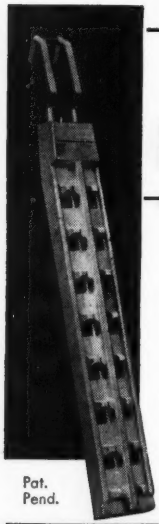
"Vienna Brand" Lime

Made from Limestone that is identical in chemical analysis and geological structure with European Imported Lime. Tests show a "lime cake" made from Allwood "Vienna Brand" Lime equals the finish made from imported lime.

WRITE FOR FULL PARTICULARS

ALLWOOD LIME COMPANY

Manitowoc • Wisconsin



Pat. Pend.

Built like a

BATTLESHIP

Look at the heavy "keel" and the rigid sides! There's strength where it is needed most in every "M" Sterling Conducta-Core Lead Alloy Anode. Built so it *can't* bend nor buckle.

Use this *dated* anode, prove its long life and its "battleship" performance in production Chromium Plating.

Write for new folder.

***Metallurgical* Products Co.**

Established 1909

35th & MOORE STS. • PHILA. 45, PA.

ALAKA Lacquers

QWIK-BAKE Synthetics

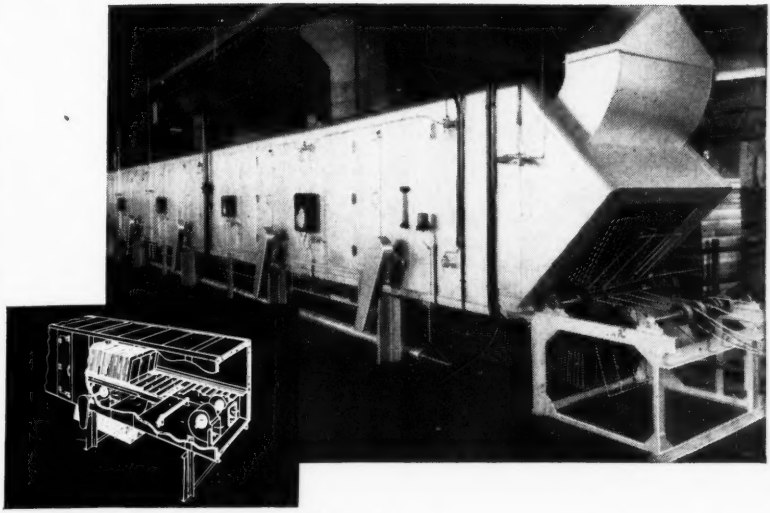
ALAKATONE Hammered Silver

SYNTHALAK Air-dried Synthetics

Custom Tailored Finishes TO FIT YOUR REQUIREMENTS

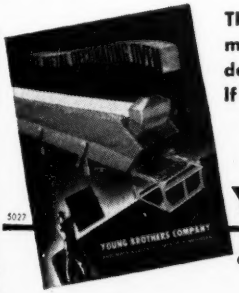
LACQUER & CHEMICAL CORPORATION

222 FORTIETH ST. BROOKLYN 32, N.Y.



REDUCE THE *Cost* AND IMPROVE THE *Quality* of decorated metal

This new Young Brothers Metal Decorating Oven has proved to be the most economical unit of its kind ever developed. More work can be baked in a given length of time with greater uniformity and at less fuel cost.



This unit which incorporates all the worthwhile developments of 25 years of oven experience in this field is fully described in a new bulletin just off the press—Bulletin 7L. If you haven't seen a copy of this, write for one today.

YOUNG BROTHERS CO.

6513 MACK AVENUE • DETROIT 7, MICHIGAN

THE
VARNISH PRODUCTS CO.
MAKERS OF
CEL-U-LAK Lacquers and Enamels
FORM-A-ROC—alkyd-amine enamels
ALSO
Bronzing vehicles, adhesives and other specialties for the industrial finishing of wood, metal, ceramics and plastics.
5206 HARVARD AVENUE
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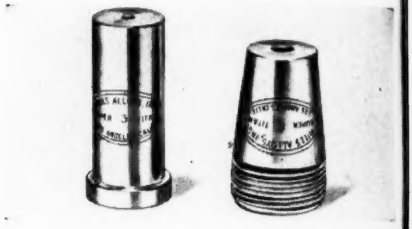
START RIGHT!
INSURE A PERFECT FINISH

DETROIT
Handy 'Tac' Rags
(Trade Mark Reg.)
Remove all Dust, Lint and Sand Particles from the Surface before Finishing.
Successfully used by leading Industrial Plants for over 11 years.
If your local Paint Dealer cannot supply you, write to Manufacturer.
DETRO MFG. & SALES CO., INC.
414 NORTH SAN PEDRO ST.
LOS ANGELES 12, CALIFORNIA

Super Titan Blasting Nozzle

A blasting nozzle provided with a special tungsten carbide liner and designated as Super Titan Blasting Nozzle has been announced by Mills Alloys, Inc., 11320 S. Alameda St., Los Angeles 2, California.

Available with either Kirksite or steel jacket, the Super Titan Blasting Nozzle is available in lengths of from 1 to 6 inches with bores ranging from $\frac{1}{16}$ to $\frac{5}{8}$ inch in increments of $\frac{1}{16}$ of an inch. Further, the nozzle is available provided with



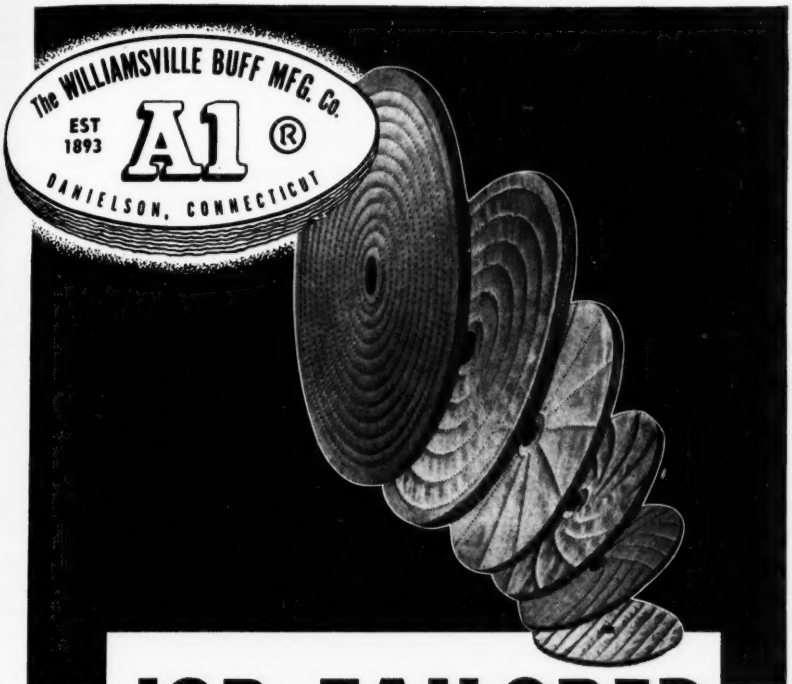
Super Titan Blasting Nozzle; socket end (left), threaded end (right)

either a socket end or a threaded end so that it is readily adaptable to various types of blasting machines.

Safety Hand Truck

A lightweight, sturdy hand truck, combining many safety features, has been announced by General Scientific Equipment Co., 27th and Huntingdon Sts., Philadelphia 32, Pennsylvania.

Of riveted, welded, and bolted construction, with tubular handles, and 6-inch aluminum acid-resistant wheels or rubber tires, the safety all-purpose hand truck has two carrying positions which adapt it to a variety of portage jobs. According to the manufacturer, the truck can be used in the open position to safely move carboys, acetylene tanks, barrels, packages, and other items in a vertical position to avoid spilling the contents. In the closed position the truck can be used as a hand truck to transport boxes, barrels, and similar items in the conventional manner. The hand truck can be easily converted from one position to the other and is firmly secure in either position. A chain is provided to hold items being transported.



JOB-TAILORED

Buffs and Polishing Wheels For Every Finishing Purpose

Name your metal finishing needs—and Williamsville can fill the bill with job-tailored buffs and wheels for every type of coloring, cutting, and polishing.

Williamsville Buffs are made to last longer—the highest quality sheeting carefully cut, turned, stitched, and trimmed. Cutmaster Buffs are bias cut, run cool—minimize burning and raveling—save compounds.

For over half a century Williamsville engineers have helped finishers to meet and beat competition with better finishing at substantial savings in overhead costs. Ask how we can do the same for you—now! Write, wire or phone.

The WILLIAMSVILLE BUFF MFG. Co.
DANIELSON, CONNECTICUT

Miccrosol E-1003 Rack Coating

An improved single-dip heat-cured rack coating to be known as Miccrosol E-1003 has been introduced by the Michigan Chrome & Chemical Co., 6340 E. Jefferson Ave., Detroit 7, Mich. In a single application, the material is claimed to produce a tough, smooth, leather-like coating featuring unusual tensile strength, adhesion, hardness, tear strength, elongation, and recovery.

According to the manufacturer, Miccrosol E-1003 combines, in addition to positive insulation and protection, permanent flexibility, positive and continuous adhesion, maximum scuff resistance, and simplicity of application. Said to withstand all commonly used plating solutions, acids, and caustics, the material is nonporous and has high dielectric strength.

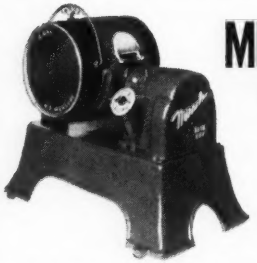
Only one coat of Miccrosol E-1003 is required over the primer, which is said to often outlast the life of the rack itself. The unusual and lasting adhesion of the prime coat, which is also impervious to acids and caustics, is claimed to completely eliminate contamination due to carry-over from capillary action. With the material, racks are said to be completely processed, ready for use, in approximately 2 to 4 hours.

Non-Slip Blow Gun

A new blow gun has been added to its line of water savers, fluid savers, and air savers by the Lonn Manufacturing Co., 131 E. New York St., Indianapolis 6, Ind. The gun is equipped with rubber ridges to keep it from slipping out of the user's hands when they are oily or greasy. These functional ridges are moulded in the oil and solvent-resistant Neoprene which is used in all Lonn blow guns.

Alaka Color Card. An eight-page color card containing sample shades of Alaka lacquers and enamels is available from the Lacquer & Chemical Corp., 214 40th St., Brooklyn 32, N. Y. Copy free upon request.

"The Metal Decorating Oven" is the title of an eight-page illustrated bulletin designated as Bulletin 7-L issued by the Young Brothers Co., 6513 Mack Ave., Detroit 7, Mich. Design and operating features of Young Brothers Ovens are illustrated and described, and oven performance data are included. Copy free.



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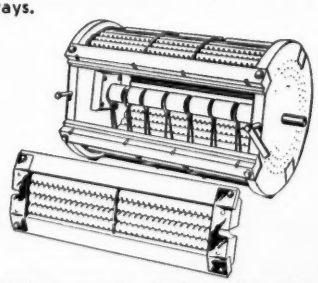

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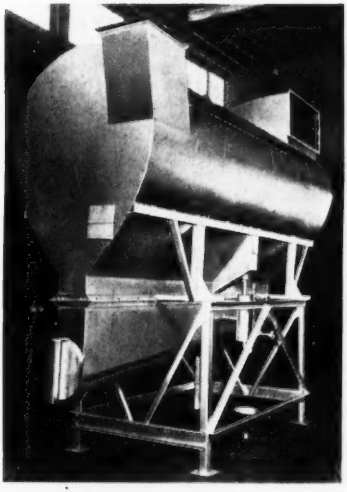

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New Literature

Plating Rack Folder. A folder illustrating and describing distinctive features of the Naraco Removable Work Holders has been issued by the National Rack Co., 22-06 Morlot Ave., Fair Lawn, N. J. Copy free upon request.

Paint Rejuvenator Leaflet. Operating characterics, uses, applications, and specifications of the Miracle Blue Boy Paint Rejuvenator are featured in a leaflet distributed by the Miracle Paint Rejuvenator Co., 128 E. 10th St., St. Paul, Minn. The leaflet is illustrated with a photograph of the machine. Copy free upon request.

"Unichrome Clear Dip" is the title of a four-page folder issued by United Chromium, Inc., 51 E. 42nd St., New York 17, N. Y., describing an improved chemical treatment for producing a corrosion-resistant finish on zinc or cadmium plate. The folder outlines the operating cycle of this process and furnishes general specifications on its use. Copy free.

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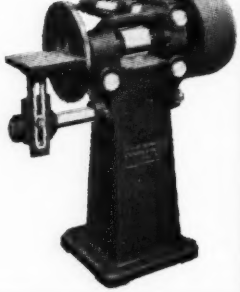

PRODUCTION MACHINE CO.

GREENFIELD, MASS.

Packer Bulletin No. 17. A two-page illustrated bulletin designated as Bulletin No. 17 describing Model No. 18 universal abrasive belt head has been issued by The Packer Machine Co., Meriden, Conn. Suggested applications of the abrasive belt head are listed and characteristics of the device are described. Copy free.

Sel-Rex Catalog Sheets. Catalog sheets printed in three colors describing six models of Sel-Rex Selenium Rectifiers have been issued by the Bart-Messing Corp., 45 Morgan Ave., Brooklyn 6, N. Y. Complete descriptions and specifications, together with suggested applications, are outlined in the catalog sheets. Copies free upon request.

Magnaflake Folder. A four-page folder describing the properties of Magnaflake aluminum powder, aluminum paste, and bronze powder has been issued by Magna Manufacturing Co., Inc., 444 Madison Ave., New York 22, N. Y. The folder contains a list of various grades of powders and pastes that are immediately available. Copy free upon request.

"Industrial Chemicals" is the title of a 32-page illustrated booklet issued by The Harshaw Chemical Co., 1945 E. 97th St., Cleveland 6, Ohio. The booklet lists alphabetically the chemicals supplied by The Harshaw Chemical Company, together with specific listings of chemicals used in various industries. Such industries include electroplating, ceramics, scientific laboratories, and other chemical industries. Copy free upon request.

Schauer Speed Lathe Catalog 480. A 32-page catalog issued by The Schauer Machine Co., 2060 Reading Rd., Cincinnati 2, Ohio, illustrates and describes the company's complete line of speed lathes designed for secondary finishing operations on small metal and plastic parts. The catalog details applications of individual types and sizes of speed lathes for polishing, lapping, filing, and deburring a wide variety of work ranging from screws and studs to gears, pulleys, dies, and large stainless steel bowls. A complete description and specifications of each type of speed lathe are presented.

Copy of Catalog 480 is available to individuals addressing requests on their company letterheads.

Nukem Bulletins. Attractive four-page bulletins describing Nukemite 24, Nukemite 35, and Nukemite 40 have been issued by Nukem Products Corp., Buffalo 20, N. Y. The bulletins suggest industrial applications of and uses for the three Nukem products which are corrosion resistant coatings, each formulated specifically for specialized industrial applications. Copies free upon request.

"The Refresher Course in Porcelain Enameling." Published by Enamelist Publishing Co., 4150 E. 56th St., Cleveland 5, Ohio. 127 pages. Illustrated. Paper covers. Price, $1.00.

The handy pocket size ring-bound booklet has been revised and abridged from "A Manual of Porcelain Enameling," also published by the Enamelist Publishing Company. Various phases of porcelain enameling operations are discussed, including the design and fabrication of sheet iron parts, the testing of porcelain enamel furnaces, enamel mill room practice, process control methods and porcelain enamel shop construction, equipment and layout. Illustrations include views of various porcelain enamel processing equipment together with testing equipment used for process control. The publication is a condensation of an original 513-page book edited by J. E. Hansen.

Air Filter Bulletin. A two-color eight-page bulletin designated as Bulletin SIF describing Staynew dry-type intake filters for all types of air compressors, Diesel, and gas engines, blowers, motors, and generators has been issued by the Dollinger Corp., Rochester 3, N. Y. Descriptions of the various models, together with size and performance data, are included. Copy free upon request.

Binghamton Flexible Shaft Machines. The Binghamton Flexible Shaft Division, Swartz and White Manufacturing Co., 486 Chenango St., Binghamton, N. Y., has prepared a 20-page catalog which presents complete information on a line of flexible shaft machines and shaft drives for use in sanding, grinding, polishing, buffing, and other operations. Information on the use and care of flexible shafts is included, as well as tables for use in the proper selection of flexible shaft machines and equipment. Copy free.

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"Finishing Facts" is the title of a 20-page brochure issued by the Lacquer & Chemical Corp., 214 40th St., Brooklyn 32, N. Y. Finishing problems, application of lacquers, and preparation of surfaces for lacquering are discussed. Descriptions of several lacquers manufactured by the company are included in the brochure. Copy free upon request.

Granium Descriptive Folder. A folder outlining the advantages of using Granium in silver plating has been issued by Granium-Gray Products, Dept. P-3, 6100 E. Washington Blvd., Los Angeles 22, Calif. Included in the folder are actual silver plated samples to illustrate the advantages claimed for Granium products. Copy free upon request.

Oakite Service Report. A service report describing the use of Oakite Special Protective Oil for the rust protection of metal parts in process or in storage has been issued by Oakite Products, Inc., 20 Thames St., New York 6, N. Y. The service report provides necessary data on the specialized rust preventive oil and illustrates by means of a flow chart the points in the production process where Oakite Special Protective Oil might best be used. Copy free upon request.

Behr-Manning Bulletin. A six-page illustrated bulletin providing helpful information on belt grinding and finishing with idler backstands has been issued by Behr-Manning, Troy, N. Y. The bulletin suggests proper polishing methods adaptable to various polishing problems involving abrasive belts. Copy free upon request.

Kellogg-American Handy Pocket Catalog No. 59. A 20-page illustrated catalog describing Kellogg - American Micro-Spray Gun and paint spray equipment has been issued by the Kellogg Division, American Brake Shoe Co., Rochester 9, N. Y. The catalog describes characteristics of various models of Kellogg-American spray guns, in addition to air control units, pressure feed tanks, compressors, and miscellaneous paint spray equipment. Copy free upon request.

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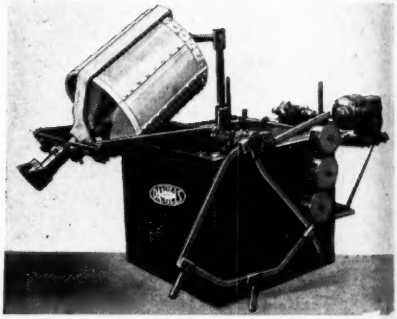

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Industrial Chromium Plating Catalog. A catalog designed to provide helpful information for successful applications of industrial chromium plating has been announced by the Chromium Corporation of America, 120 Broadway, New York 5, N. Y. The 36-page illustrated publication outlines the accomplishments of chromium plating, and describes the performance that may be expected under known operating conditions. Descriptions of the characteristics of chromium plating, together with tables and charts, complete the catalog. Copy free upon request.

"How to Select the Right Oven for Your Process" is the title of a 32-page illustrated manual offered as a planning guide for production engineers concerned with heating, heat treating, baking, or curing problems by Gehnrich & Gehnrich, Inc., 3232 57th St., Woodside, Long Island, N. Y. The manual discusses the four basically different types of oven heating systems, the different heating media, temperature and safety control, insulation, the action of different products under heat, and the seven basic oven and heater types. Copy available upon request.

A.S.T.M. Standards on Paint, Varnish, Lacquer, and Related Products. Published by the American Society for Testing Materials, 1916 Race St., Philadelphia 3, Pa. 580 pages. Illustrated. Heavy paper covers. Price, $4.35.

This volume presents the latest compilation of A.S.T.M. standards on paint and related products. There are a total of more than 170 specifications, tests, and definitions, including 45 specifications covering various types of pigments—white, black, mineral iron oxide, blue, green, yellow and orange, red, metallic, and so on. Twenty-six test methods covering various types and properties of pigments are listed. These include chemical analysis, absorption, specific gravity, tinting strength, and so on.

Nine specifications and five test methods relate to drying oils, paint driers, and thinners, and twelve cover shellac, varnish, and varnish materials. In the field of lacquer and lacquer materials, there are 21 specifications and 11 test methods. There is a large section on general paint tests and paint weathering tests.

A handy table of contents is conveniently provided at the front of the book together with a list of A.S.T.M. Paint Standards in numerical sequence.

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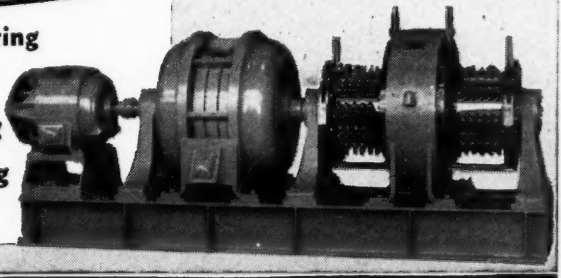

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